Techdebate WAN CONNECTIVITY: MPLS or PUBLIC INTERNET? PAGE 21

NETWORKWORLD

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IS QUANTUM COMPUTING REAL?

THE ANSWER IS YES AND NO. AND YES AND YES. AND NO AND NO. **Page 26** ▸

Six factors slowing data center moves to converged I/O

BY JIM DUFFY

SO IF converging the I/O infrastructure in data centers is all the rage, what's taking IT shops so long to do it?

Six reasons:

- New technology attempting to replace proven and reliable implementations.
- New equipment requirements.
- New standards and proprietary techniques to consider.
- Organizational and operational changes.
- Infrastructure management and stability.
- Questionable benefits beyond the server and access switch layer.

Converged I/O — running LAN and storage data through the same wires and switches to reduce elements and cost — is a years-long journey, not an endeavor to be rushed or taken lightly. IT shops have to weigh their situation carefully and know where they want to go, and how and when to get there, before embarking.

▸ *See* **Converged,** *page 11*

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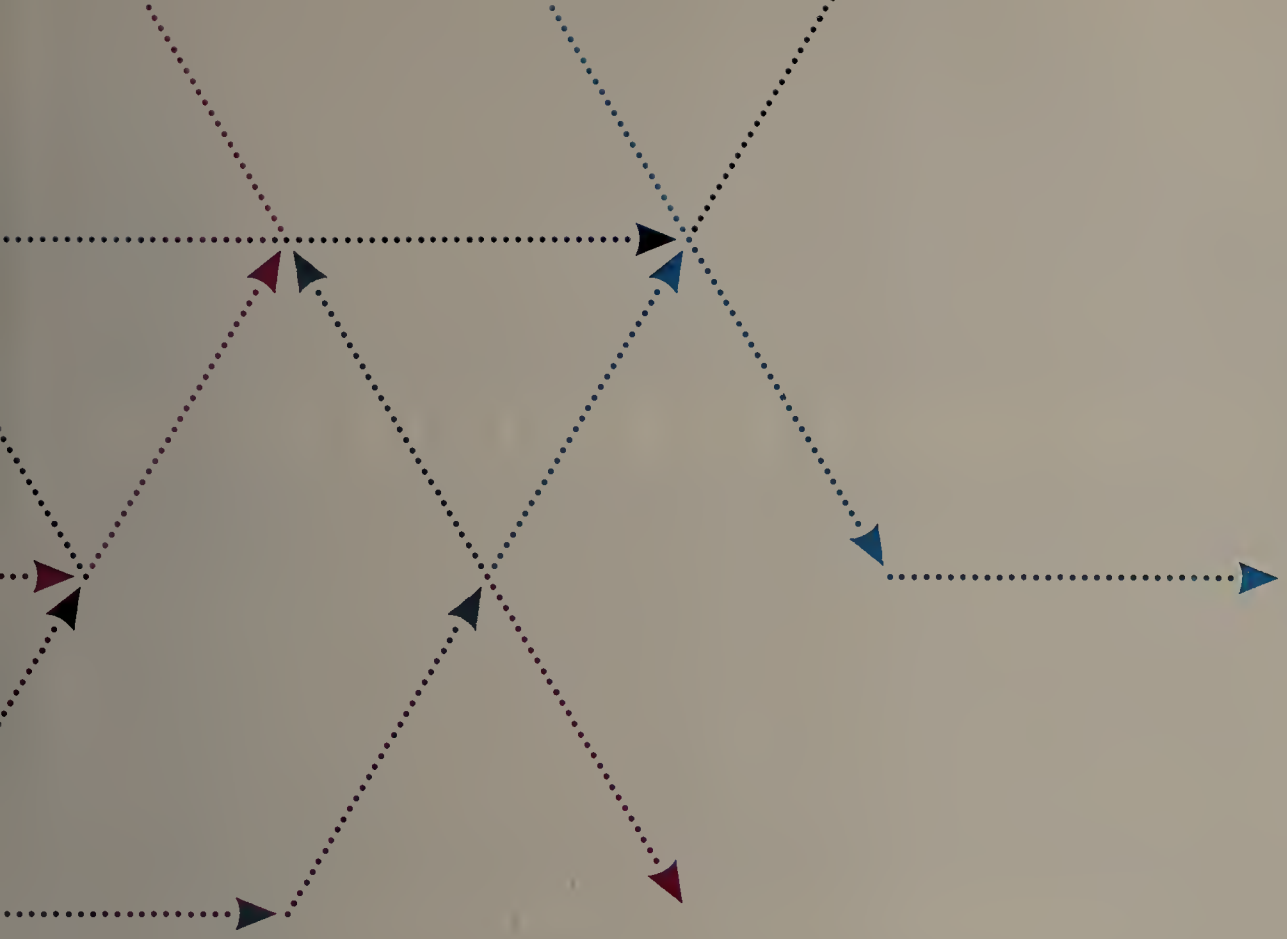
BladeCenter E
IBM



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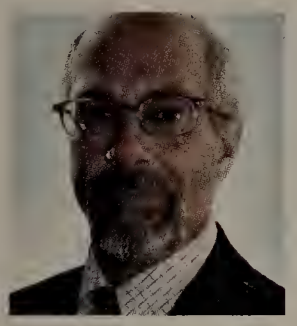
1. The 40% cost savings are based on a comparison of the acquisition costs of 10 current generation HP rack optimized solutions (i.e., DL380 G7 Proliant with 10 GbE Ethernet and Fibre Channel infrastructure) to 10 current generation IBM BladeCenter and HS22 systems with converged fabric solutions from Brocade. See www-03.ibm.com/systems/bladecenter/hardware/openfabric/fcoe.html. The IBM solution includes chassis infrastructure. Pricing utilizes publicly available pricing per port for ToR ethernet and FC switching infrastructure as of Jan 2011. The 40% networking hardware costs savings result from eliminating separate Ethernet and Fibre Channel cards and switches in the deployment of an IBM BladeCenter FCoE solution for 10 servers and associated networking hardware in comparison to the HP solution. IBM, the IBM logo, ibm.com and BladeCenter are trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the Web at www.ibm.com/legal/copytrade.shtml. Intel, the Intel logo, Xeon and Xeon Inside are trademarks of Intel Corporation in the U.S. and other countries.

FROM THE EDITOR | JOHN DIX

New face, same challenges at HP

HP has put the rumors to rest by replacing CEO Leo Apotheker with Meg Whitman, but the big questions swirling around the company are anything but resolved.



The world might have given Apotheker the benefit of the doubt for not growing revenue during his 11 months in office, but it was the flip-flopping that was deadly, that signaled to the world HP is adrift.

We're spinning off the PC business. Uhhh, maybe not.

WebOS is the future and we'll ship it on all devices. We're killing it.

Our tablet rules. It is dead. Oh, we're making more to sell. No, it's really dead.

And the parade of CEOs actually just accentuates the idea that the company is desperately trying to find its way. HP had four CEOs for the first 86 years of its existence and, with the appointment of Whitman, six in the last 12 years (see a listing of CEOs at tinyurl.com/3fo5w57).

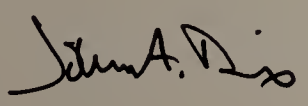
Under Apotheker, HP's stated goal was to "move HP into higher value, higher margin growth categories," and it would be surprising if that isn't Whitman's mandate as well. This is, after all, what IBM CEO Samuel Palmisano has done so successfully at Big Blue over the last nine years, shifting the company's focus to software and services.

Today, according to Yahoo Finance, IBM's revenue of $104 billion (on a trailing 12 month basis) is 23% less than HP's, yet IBM's net income of $15 billion is 66% greater. Looked at another way: HP is generating a 7% margin while IBM is up at 14%.

What gets lost in all of the change at HP is the fact that the company is actually realizing fruits of earlier efforts to focus on higher-margin businesses. In the first nine months of this fiscal year, HP's service business, built on the acquisition of EDS in 2008, represented 28% of revenue and generated a respectable 13.5% return. That's second only to the Personal Systems Group which represented 31% of sales.

While HP's software business is also high margin (19% in the third quarter) and growing (up 14% in the first three quarters of this year compared to last), it accounts for less than 3% of revenue. It will take a lot more than the addition of Autonomy (the software company HP plans to buy for $10 billion) to bolster this side of the house.

So Whitman will have her work cut out for her, not the least of which is establishing what HP stands for. The company's current focus on "Instant on," which it came out with in early 2010, doesn't cut it. In a world where information is the business currency, when is a corporation ever off?



inside

SEPTEMBER 26, 2011

peersay

Data center terminology

IF CISCO IS using typical standards-based language for data center redundancy (ANSI TIA-942, or Uptime's tiers), the higher the tier, the higher the reliability of the center (from 1 to 4) (Re: "Cisco unveils dual-role data center"; tinyurl.com/3mwyfbn). A Tier 1 data center has no redundancy in power, cooling or other infrastructure. Tier 2 (known as N+1) adds extra capacity to these systems to enable continued operations if a single unit fails or needs maintenance. If you tell a data center designer you want a Tier 1 data center, you may get a funny look. Perhaps Cisco is using these "tiers" to express primary vs. secondary levels of reliability? Unfortunately, "tier" has a specific meaning to data center people. For most clients, a Tier 2 data center is a starting point. Tier 3 is very nice. Tier 4 is very rare.

Michael Cleveland

Gmail in the enterprise

IT MAKES NO sense for SMBs to dedicate scarce and expensive internal IT resources to maintain, back up and upgrade internal messaging systems. At $50 per user per year Google Apps for Business is a bargain even if all you use is Gmail (Re: "Gmail threatens Microsoft in enterprises, says Gartner"; tinyurl.com/3f4jngb). For small incremental charges you can subscribe to CloudLock to secure access to Google Apps docs and Backupify to backup Google Apps and Syncdocs if you want to sync your Google Apps documents to one or more PCs. If the Fortune 500 is uncomfortable with using Google Apps, who cares? For the tens of millions of people working for SMBs, Google Apps for Business is a logical and economical way to go.

Microsoft would be smart to improve the functionality of Office 365 without requiring installed copies of Office 2007 or 2010 — work with them, yes, require them, no. The days of the locally installed $300 to $500 Microsoft Office suite are numbered.

Tim Wessels

Windows 8 interface

WINDOWS 8 APPEARS to be a continuation of a trend to dumb down computer systems to the level of being a mere entertainment device for 6-year-olds, rather than a get-down-to-business, multifunctional, efficient and configurable tool for getting all things done that need to be done (Re: "Windows 8 steps beyond the desktop"; tinyurl.com/3gx58ut).

If Microsoft is truly bent on marketing a casual consumer social device, then by all means, have them develop such an OS and its accompanying apps that are targeted to that environment and market it separately. But if their intention is to provide an improved tool that serious-minded people can depend on, they need to continue to produce a usable business-oriented OS for real-world use, a leaner, meaner OS in the tradition of Windows 2000, XP and 7.

Rick762

HTC exec on iPhone

HMM, HTC EXEC gets marketing advice from schoolkids — good luck with that! (Re: "HTC exec: iPhones for old farts"; tinyurl.com/3lzvmza)

When I was at school I drove a Toyota, my dad drove a Porsche. That didn't make the Porsche uncool, it just meant I couldn't afford the cooler car.

Simon Gillson

> Windows 8 appears to be a continuation of a **trend to dumb down computer systems.**

100G Ethernet adoption

GENERAL RULE OF thumb in Ethernet has been that adoption doesn't pick up until you can get 10 times the performance for less than four times the cost (Re: "The when and how of 100 Gigabit Ethernet"; tinyurl.com/3nh9dyp). 10G Ethernet adoption only really started picking up in the last 18 months (standards were ratified in 2002). Of course the Googles and Facebooks of the world are going to push the envelope here and even look at developing the next generation of speeds, but enterprise data centers aren't going to need to worry about 40G/100G for a couple of years.

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bits

HP board ousts Apotheker, Whitman in as CEO

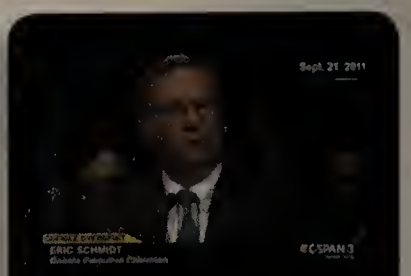
HP CEO LEO Apotheker was ousted from his position last Thursday and replaced by HP director and former eBay CEO Meg Whitman, less than a year after he took the job. During Apotheker's short tenure, the market didn't react well to a number of moves he made, including making plans to spin off HP's PC division. The choice of Whitman as CEO is a bit of a mixed bag, according to Charles King, president and principal analyst with Pund-IT. "On one side, she's a known entity and she's obviously got significant experience running a multi-billion dollar company at eBay," he said. However, Whitman has very little in her background that makes her a good match for a company of HP's size, nor is she deeply experienced in enterprise IT. Going forward, one first step for HP and Whitman could be to reevaluate the company's core PC and WebOS businesses and continue developing a strategy around software and the cloud without undermining existing businesses. A big hurdle will be regaining the confidence of investors put off by HP missing its financial targets in three recent quarters, jumping into the Autonomy and Vertica acquisitions, and Apotheker's inability to effectively communicate HP's strategy for the future. "Investor confidence is a very difficult thing," said IDC analyst Crawford Del Prete. "When it starts to get eroded, it's very difficult for that person to get confidence back." ***tinyurl.com/3fpsn7m***

Open this malware or I'll sue you

THE LATEST social engineering trick to get victims to open malicious email attachments accuses them of being spammers and threatens to sue them if they don't stop. It's all in an attempt to get targets to open up the zip attachment by telling them it contains evidence of their spamming. Actually it's an .exe file that infects the machine but displays like a document, according to the Websense Security Labs Blog. The attachment installs a downloader Trojan that copies itself to the system path so it executes when the system boots up. ***tinyurl.com/3purlgy***

Office work is so last century

THE DAYS of employees going to the same office for work every day are over, apparently. Forrester Research surveyed nearly 5,000 information workers and found that 50% of them split time between their office and remote locations, while 45% still work at the office only. Unsurprisingly, Forrester found that workers get more flexibility as they move higher up the totem pole: 63% of managers and supervisors and 87% of directors reported working in multiple locations, whereas only 40% of individual workers said they worked both at the office and remote locations. The survey also found that 35% of information workers use their smartphones for work and, among these users, 48% said they chose their smartphone "without considering what their company supports." ***tinyurl.com/3j44omf***



IT VIDEO

Schmidt: "We're in the ranking business"

Several U.S. senators accused Google of giving search preferences to its own suite of services over competitors, but Executive Chairman Eric Schmidt denied that his company is manipulating search results during a hearing last week. ***tinyurl.com/3t4cvtf***

Apple's tablet reign to continue

ANYONE HOPING for a scrappy underdog to knock the iPad off its perch will have to wait a long time. Despite the flood of new competitors entering the market, Gartner projects the iPad will hold more than two-thirds of the global tablet market in 2012 and will still hold about 45% in 2015. As for iPad competitors, Android-based tablets will experience the most success as Gartner projects their share of the market will steadily increase from 17% this year to 22% in 2012 and 36% in 2015. Microsoft's Windows-based tablets (10.5% of projected market share in 2015) and Research in Motion's QNX-based tablets (8% projected share in 2015) will continue to be minor players over the next four years. ***tinyurl.com/3d75vn9***

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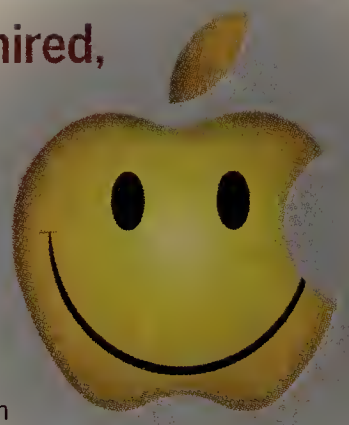


APPLE, RIDING continued high demand for its Mac computers and iPad tablets, has topped rivals in two new surveys of customer satisfaction.

Apple's customer satisfaction ranking rose a point from 86 to 87 (on a scale of 100) to top the American Customer Satisfaction Index, which focused on PC makers. This is the eighth straight year Apple has taken the crown, topping its own record score from last year. In a separate ranking based on the Global Customer Experience Management Survey from Beyond Philosophy, Apple topped the list of most admired technology companies by customer experience experts. Amazon and Zappos finished second and third.

good

Social engineering costing businesses big time

SOCIAL ENGINEERING attacks are widespread, frequent and cost organizations thousands of dollars annually according to new research from security firm Check Point Software Technologies. A survey of 850 IT and security professionals located in the U.S., Canada, U.K., Germany, Australia and New Zealand found almost half, 48%, had been victims of social engineering and had experienced 25 or more attacks in the past two years. Social engineering attacks cost victims an average of $25,000 to $100,000 per security incident, the report states.

bad

Microsoft exec's famous last tweets

GEEKWIRE REPORTED last week that a Microsoft product manager named Joe Marini has left the company in the wake of tweeting about an unannounced Nokia phone running Windows Phone 7. Microsoft acknowledged Marini has left the company, though declined to comment on whether it was because he ran afoul of the company's corporate social media policies. Marini earlier this month was among Microsoft's speakers at its BUILD conference.

ugly

Adobe patches Flash bug

ADOBE LAST week patched six vulnerabilities in Flash Player, including one that's already being exploited by attackers. That vulnerability, identified as CVE-2011-2444, shares some traits with an earlier Flash flaw that was used to target Gmail accounts in June. Adobe labeled CVE-2011-2444 a cross-site scripting (XSS) vulnerability, a class of bugs often used by identity thieves to steal usernames and passwords from vulnerable browsers. In this case, browsers were not directly targeted; rather, attackers exploited the ubiquitous Flash Player browser plug-in. Like the June Flash bug, CVE-2011-2444 was reported to Adobe by Google's security team. Four of the five other Flash bugs that Adobe patched could be exploited by attackers to run their malicious code on victimized computers, Adobe said in its advisory. ***tinyurl.com/3jvz8vd***

Microsoft gets Casio to sign Linux patent protection deal

LEST WE forget that Microsoft still insists Linux violates 235 of its patents, Microsoft issued a reminder last week. It announced a patent licensing deal with Casio Computer Co. Ltd. that, "among other things, will provide Casio's customers with patent coverage for their use of Linux in certain Casio devices," Microsoft says. The terms of the deal were not announced, except that Casio will pay Microsoft an undisclosed sum of money. This news signals the company still hasn't given up on its claims on Linux. Microsoft has announced a handful of licensing deals involving Linux since 2007 including with Novell for SUSE (now owned by Attachmate), Linspire, Melco (the Japanese parent company of Buffalo), Fuji Xerox and Samsung. ***tinyurl.com/3dub9eb***

PARITY BITS

Personal Tech in the enterprise

28% allow employees to use personal laptops and smartphones without insisting on special controls

42% allow use of personal equipment but install tools that enable the company to maintain control

30% don't allow personal tech

SOURCE: NETWORK WORLD SURVEY OF 2,005 READERS

Faster downloads for smartphones

STRANGELOOP IS coming out with a Web-site optimizer that speeds up page builds on mobile devices based on Apple, Android and Microsoft operating systems. Strangeloop claims Mobile Site Optimizer can make pages load 2.5 times faster on an iPad and 3.5 times faster on an iPhone 4 if the site has been visited before. Mobile Site Optimizer employs an HTML5 feature called supercache that lets browsers store Web objects even if the phone is turned off and turned back on again. The cached items don't have to be downloaded, so build time is reduced. ***tinyurl.com/43qulx7***

► **Converged,** *from page 1*

Generally, converged I/O constitutes three key elements: 10Gbps Ethernet, Fibre Channel-over-Ethernet (FCoE) and Ethernet equipped with the lossless Data Center Bridging (DCB) standard from the IEEE. FCoE, which tunnels Fibre Channel storage traffic through Ethernet, requires DCB in order to have Ethernet behave as if it had the resiliency of Fibre Channel — lossless data transmission.

According to Dell'Oro Group, FCoE realized $94 million in revenue in the second quarter of 2011, on a shipment of 210,000 ports. The research firm expects 930,000 ports to ship this year, accounting for $422 million in revenue — or about 7% of 10G Ethernet revenue.

But there are many standards and emerging standards to consider — as well as proprietary vendor schemes — when evaluating a converged I/O infrastructure throughout your data center. Currently, those standards are in place for FCoE and DCB at the blade server and access switch level, and FCoE is largely a free technology feature of 10Gbps Ethernet switches and converged network adapters.

But standards and methods for extending converged I/O from the server rack and access switch, where it is now taking hold through the core of the data center network, are still percolating. Indeed, some of these standards are competing to become the de facto technique for enabling multipath networking and multihop FCoE capabilities.

Xsigo is a maker of virtual and converged I/O infrastructure products — namely, its I/O Director and Server Fabric platforms. In 2010, privately held Xsigo more than tripled its revenue from the year before, so the company sees a lot of demand for and sales of converged data center I/O gear.

"When servers ran one application per server and that application did not change, you're typically only dealing with a few network connections per server, and pretty low utilization of those connections," says Jon Toor, vice president of marketing for Xsigo. "When you virtualize a server you're dealing with a lot more connections, a lot more workload, and it creates a need for a different way of hooking things up."

Xsigo, though, pitches its products as alternatives to having to deploy FCoE to achieve converged data center I/O. Cisco, the market leader in FCoE switches, has been attempting to undermine Xsigo's strategy and company stability.

HP, which enjoys a 20% share of the FCoE blade switch market, says more than half of workloads will be virtualized by 2012, which puts additional strain on the access network.

"Customers are deploying six to eight Gigabit Ethernet connections because virtualization requires more bandwidth out of the servers," says Kash Shaikh, director of marketing for HP Networking. "That amount of cabling blocks airflow. [With converged I/O] you can take that down to two 10G connections coming out of the server and into the first hop switch."

In addition to server virtualization, other converged I/O drivers are cloud deployments, infrastructure flexibility, an increasing amount of server-to-server traffic and consolidation of I/O density with virtual machines, says Shaun Walsh, vice president of marketing with Emulex. But the march to converged I/O will be gated on the amortization cycles of IT shops and the question of who and what will manage the new infrastructure.

"They have existing infrastructures that they need to amortize over time to get the full value from them," Walsh says, which is usually three to five years.

Management of the infrastructure from both an operational and an organizational perspective will have to be considered carefully as well, he says. LAN and SAN teams manage segregated data and storage networks now with likely different operating methods.

"The biggest challenge for organizations is not physical deployment, it's the policy and management deployment," Walsh says. "Sit down with the teams, make sure that they have a meeting of the minds on what the purpose is, why we're doing it and who's going to manage what segments of it."

There can be some hesitation when it comes to combining traffic from currently isolated networks.

"What are the security implications of adding Fibre Channel to an IP-driven environment?" Walsh asks. "That's always one of the big concerns storage administrators have expressed to us."

Operationally, IT shops should have no less management capability than they had before converging, Walsh notes. They should have the same, or at least a familiar, set of tools to work with. It is, after all, Ethernet.

"If there's any Achilles' heel it would be the management tools," Walsh says. "The only real risk I see to adoption is that the management tools mature to the same level that IT managers have today. But I don't see anything that's going to disrupt this."

Nonetheless, the savings seem compelling: Customers are saving 30% to 50% in capital expenditures, 50% to 60% in blades and cooling and 70% to 80% in cabling, Walsh says. And HP says two FCoE-enabled blades can replace up to 217 separate piece parts — Ethernet network interface cards, Fibre Channel Host Bus Adapters, etc. — with rack mount servers.

But that still may not be enough to sway the masses.

"The one thing ROI doesn't measure is stability," Walsh says. "IT guys put stability very, very high on their list of things. They've got to have another reason to move to take that stability risk. That's why these other external factors drive it more than the core ROI factors."

Cisco says stability is intrinsic to FCoE, and that's why about one-third of the company's Nexus 5000 data center switches are deployed with active FCoE licenses. The Nexus 5000 racked up 50% of the FCoE ports shipped in the second quarter, according to Dell'Oro, and Cisco also has more than 7,000 UCS customers — FCoE is an integral technology to UCS.

"Operationally, it is consistent with Fibre Channel," says Omar Sultan, senior manager of data center architecture at Cisco. "And at the end of the day it's Fibre Channel. It's just a different transport. For the installed Fibre Channel base, it's not a huge leap. The things they're used to working with continue to work."

Perhaps, but for some Fibre Channel users it could be a huge leap, according to Fibre Channel market leader Brocade. Every customer is different and some may find the cost savings elusive.

"The economics are not always there today," says Doug Ingraham, vice president of product management at Brocade. "Buying separate Fibre Channel and Ethernet connections can be less expensive than the 10G Ethernet connections we use for FCoE and Data Center Bridging. But that varies by customer."

Ingraham acknowledges that the savings benefits of FCoE will be realized over time at the server access and access switch layer. Deeper into the data center network toward the core, however, the benefits may not accrue.

"If you're going past the top-of-rack or the first hop of the network then you start getting into, will it really make sense to converge your data and storage traffic across the same network?" Ingraham says. "Because you're starting to pump lots of traffic across aggregated nodes that are oftentimes more expensive on a price/port than if you were to just keep your data and storage networks separate, regardless of technology."

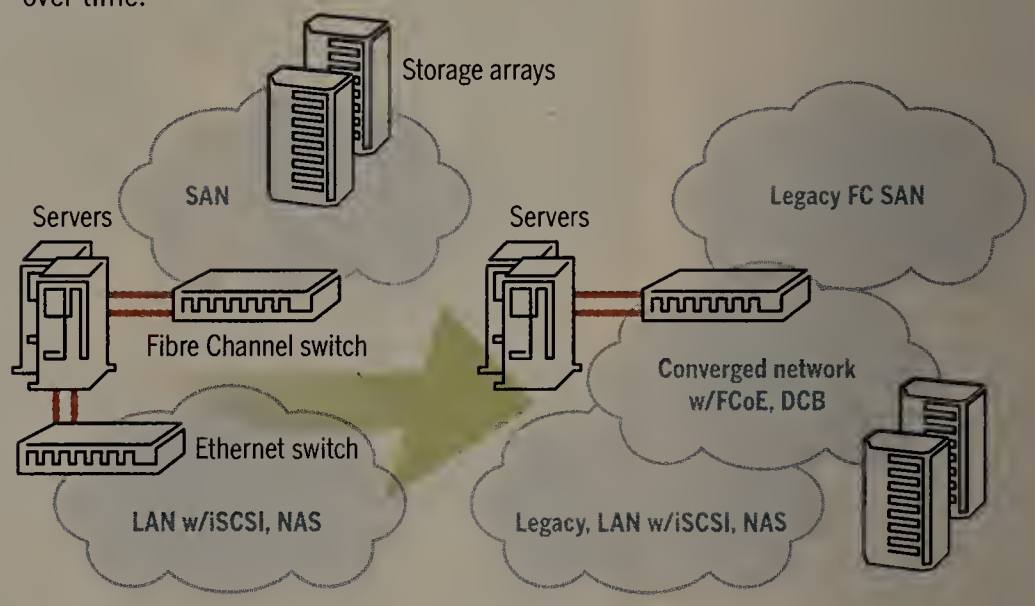
HP concurs that FCoE toward the core of the data center network does not make sense.

"At this time, we believe the maximum benefits are at the access layer because this is where the cabling is," Shaikh says. "As you go deeper into the network there is not as much cabling — the switch ports reduce because you continue to aggregate. Some of the proprietary implementations of core convergence still require an Ethernet switch and a SAN director. So I really question some of the cost savings there."

The journey to converged I/O

Can LAN and SAN peacefully cohabitate?

Separate LAN and Fibre Channel SAN infrastructures (left) and their separate edge and core switching, and management tools, can be migrated to a converged infrastructure through a single switch and common adapters (right) that support Fibre Channel over Ethernet (FCoE) and Data Center Bridging (DCB).
A legacy Ethernet switch and LAN would still support access to iSCSI and NAS storage environments, while a legacy Fibre Channel SAN can be maintained for business critical data, or to be migrated to the converged infrastructure over time.



SOURCE: THE SERVER AND STORAGE IO GROUP, STILLWATER, MINN.

And keeping FCoE networks separate actually eases management, Ingraham claims, and may reduce capital equipment costs by requiring fewer aggregation points between those two networks. It may also ease organizational and operational stress.

"The thing with FCoE and converged I/O overall is, it's not just technology," Ingraham says. "There's a lot of other things that customers have to be cognizant of: There's organizational structures — different networking and storage teams, how do they bring those together; how do they change their operating policies and procedures — now you have one switch doing both. Who owns that now? Who has the rights to management? Who has the rights to make changes? These are a lot of times more important questions than, 'Can we do this technically?'"

Cisco says FCoE is actually responding to those organizational shifts.

"The changes were happening in the first place," says Arnab Basu, UCS product manager at Cisco. "The organizations were having to break silos and integrate at a unprecedented level, even without FCoE. FCoE just enables or helps in that transition."

"From a day-to-day perspective, they pretty much did what they did before using the tools they did before," Sultan says, adding that the network people most times end up owning the FCoE switch.

The Cisco officials say they have not heard of any customers experiencing significant hurdles or challenges in implementing FCoE from an organizational, operational or technical perspective. Brocade is seeing virtually no demand for FCoE or converged I/O from its installed Fibre Channel base, Ingraham says.

"It's really the economics," he says. "It's new technology, and the storage networking side of the business is particularly risk-averse due to the criticality of those networks and the effects when they go down. New technology adoption there has to be proven."

But the point is not FCoE, Cisco says; the point is the benefits of converged I/O.

"We don't need to drive FCoE adoption specifically as much as we're trying to get our customers to see the value of converged infrastructure because we think that will pay off for them in the long run — regardless of how they end up doing it," Sultan says. ■

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Five priorities for HP in data center switching

BY JIM DUFFY

HP AND Cisco are currently embroiled in a war of words, market share and revenue in Ethernet switching overall, but can HP really put up much of a fight in the data center?

The data center is where virtually all of the action in switching is right now. And HP is a leading vendor of data center blade switches. But the company appears to be treading water in high-density 10 Gigabit top-of-rack switches and in the data center core.

As rivals like Cisco, Brocade and Juniper unleash more 10G switches to address top-of-rack and core requirements, HP is conspicuously quiet even after spending $2.7 billion in 2009 to acquire 3Com. A big reason for buying 3Com, according to HP, was its data center switching portfolio — chiefly, the A12500 core switch and the A5820 top-of-rack device. HP also offers the A7500 and A9500 for data center aggregation and smaller cores.

HP has been silent about the A12500's progress and that of the A5820 since the 3Com acquisition. HP did unveil a four-port Fibre-Channel-over-Ethernet module for the A5820 last year, and claims its A12500 is a leading platform in data centers in China; but beyond that, the company has largely been missing in action.

By contrast, in blade switching HP is the leader with its flagship product, the 6120. That indicates the entrenched server side of HP is driving its data center networking and computing sales, even after the 3Com acquisition. HP has at least one major gap to fill and some branching out of China to do, analysts say.

"HP has a few product gaps and probably hasn't met its sales objectives with the 3Com products," says Jon Oltsik of Enterprise Strategy Group. "I'm also hearing that success has really been limited in APAC/China."

HP says it's a serious contender now and will be even more so in data center switching when it addresses priority No. 1 in the first quarter of 2012 with a new line of top-of-rack switches.

"We are the market leader in the data center, period, in servers," says Bethany Mayer, acting head of HP Networking. "So we have a beachhead as strong as Cisco's, and I think even stronger, and combining our switching technologies together with that . . . is really what we're trying to achieve here."

Top-of-rack switching is the hottest segment of data center networking right now. The 10G Ethernet market was $1.4 billion in the second quarter, and top-of-rack switching accounted for 55% of the 1.4 million ports shipped, according to Dell'Oro Group.

That trend will continue.

"We continue to believe that almost all revenue growth in the (10G) market will come from this segment going forward and anticipate that 2011 revenues will reach $1.3 billion; accounting for 7% of (overall Ethernet switching) market revenue," Dell'Oro states. That means top-of-rack switching could account for 23% to 24% of the 10G market this year.

The top five vendors in top-of-rack switching are Cisco, IBM through its Blade Network Technologies acquisition, Juniper, Dell and Brocade. HP has been missing from this list for two straight quarters.

But HP hopes to soon change that. Company officials wouldn't divulge what its new top-of-rack switches would look like in terms of port density, throughput, switching capacity, performance and so forth — but they will support HP's own IRF multi-chassis technology and the TRILL specification for multipath forwarding in an Ethernet network.

Some say those switches can't come soon enough. In the first quarter, Oppenheimer & Co. analyst Ittai Kidron noted HP's weakness in data center switching in a bulletin on the overall market: "10GbE strength was due to Virtual Connect (blade switches), not data center traction with A12500 or top-of-rack switches. HP's still dealing with 3Com/ProCurve integration issues and is at risk of falling behind if it doesn't improve its data center portfolio by 2H11."

HP says it can't figure out where Kidron is coming from. It says its data center switching offerings are growing from a revenue perspective and that traction will continue when the new top-of-rack switch line debuts early next year.

"We have some products coming out very near term that go beyond the A5800 in terms of port performance and density," Mayer says. "That will provide us with the density we're looking for at top-of-rack, and more."

Despite HP's lag in top-of-rack, the company is No. 2 in 10G Ethernet revenue with 10.5% of that $1.4 billion market in the second quarter, according to Dell'Oro. Cisco leads with 72.4%.

HP blades led the charge. HP says it has shipped 5 million blade switch ports, and 31% of 10G ports shipped in the second quarter were from blades, while uplink ports on Gigabit Ethernet switches accounted for 15%, Dell'Oro says.

The company could use that kind of momentum in the core too, analysts say. Forrester Research's Andre Kindness says, "There really hasn't been any new [3Com inherited] products in two years. In the data center, companies are looking for leadership [in switching]. They're seeing it from Juniper and Cisco; I just don't think they're seeing it from HP at this point."

Without breaking out revenue by specific product, HP says A12500 sales have experienced 200% year-over-year growth, and that core revenue is growing faster than edge revenue.

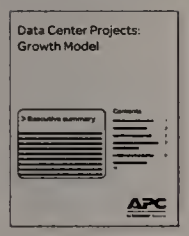
Mayer says HP Networking has realized seven consecutive quarters of growth even though Dell'Oro shows some lumpiness in those numbers: 6.3% market share in the fourth quarter of 2009 dropping to 5.6% in the following quarter, growing to 10% in the second quarter of 2010 after closing the 3Com acquisition, then dropping slightly to 9.8% in the third quarter and 9.9% in the fourth quarter and bouncing back to 11.2% and 11.1% in the first two quarters of this year, respectively.

"We're looking for something a bit more creative than just another switch," says Saar Gillai, HP Networking CTO. "If you think about Virtual Connect and some of the things we do looking at the whole problem, not just the switching domain, our next big boxes are going to enable more of that. More disruptive than just another switch." ■

Taking a swing at data center switching

Going forward, HP should have five priorities in data center switching:

- Address the top-of-rack.
- Expand its core switch to markets beyond China.
- Leverage its server and blade switch success to increase penetration of its fixed and modular data center switches.
- Further unify management across its applications and infrastructure to stimulate adoption of its FlexFabric architecture for flattening, consolidating and converging data center networks and resources.
- Continue to increase the densities and feature sets of all of its data center switches.



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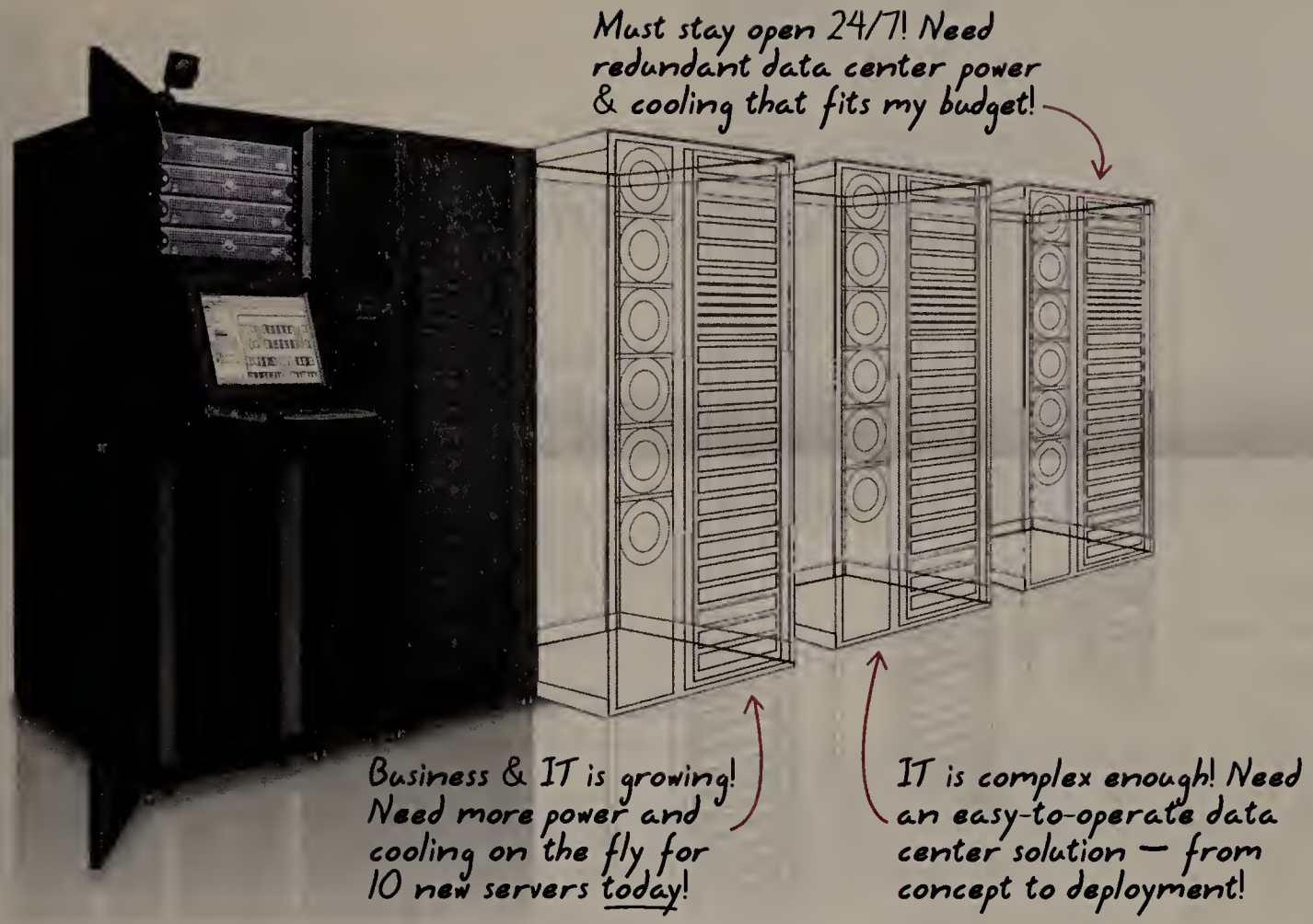

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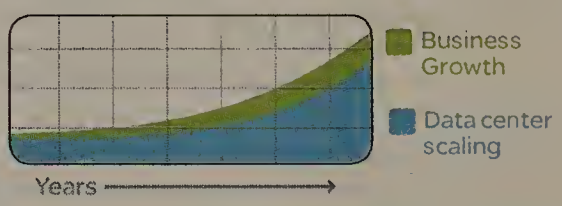

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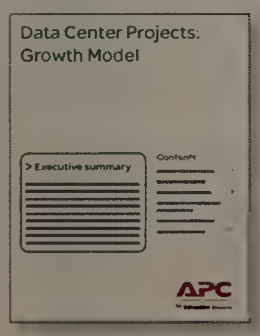

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Cisco supports Microsoft, takes on VMware

BY TIM GREENE

CISCO SUPPORT will make Microsoft's Hyper-V environment more attractive to corporate customers, but it remains to be seen whether that's enough for Hyper-V to give VMware's ESXi a run for its money.

Cisco says it will offer virtual switch support for Hyper-V that is similar to what it already offers to VMware environments via its Nexus 1000v virtual switch, meaning a richer network layer view of what's going on among virtual machines.

The collaboration of Cisco and Microsoft will give customers better monitoring and control of the virtual environment than they would get with the current option — using the native virtual switch that ships with Hyper-V, says Mike Spanbauer, an analyst with Current Analysis. "There's simply more features than within the [Cisco] switch," he says.

Spanbauer says it's not clear what effect Cisco's support for Microsoft will have on the percentage of customers that choose Hyper-V over ESXi, a battle that currently is pretty convincingly being won by ESXi. "This will further extend visibility and control so the network team can manage and influence data flows and have some handle on the performance of the entire environment," he says.

But customers using VMware instead will have similar improved visibility. "My guess is that it will be close if not equitable," he says.

How big a deal this will be when it comes time for enterprises to pick a virtual environment isn't clear. "It's hard to determine how influential network insight is to virtual-platform choice," he says. Customers ultimately will decide based on whether the Hyper-V option solves specific problems they are having managing cloud deployments, he says.

The decision will also include factors such as storage, memory and licensing issues as to what customers ultimately choose, he says.

Cisco's support for Hyper-V will come next year only after Microsoft releases Windows Server 8, which includes Hyper-V 3.0 and its augmented virtual-switch capabilities.

Cisco says it will offer two ways to peek inside Hyper-V physical machines to mine network-layer information about Hyper-V virtual machines and to extend Cisco network-layer monitoring, management and configuration to them.

The first is a version of Cisco's Nexus 1000V Series switch designed to support Hyper-V. It is a distributed virtual switch that fits Hyper-V virtual machines with virtual Ethernet cards that can be managed via another component of the switch, Cisco's Virtual Supervisor Module.

The supervisor module is tightly integrated with Microsoft System Center Virtual Machine Manager, Cisco says, which will let customers set separate privileges for different classes of admins. The Virtual Supervisor Module can be deployed on a physical appliance or virtual machine. The entire distributed switch can be hosted on a Cisco physical appliance, Nexus 1010 Virtual Services Appliance.

The combination gives current administrators in Cisco shops easier management of the virtual machines because they can deal with them via Cisco NX-OS software that they are already familiar with, Cisco says. The virtual machines seem as if they are extensions of the physical network, making it easier to enforce policies, to provision and to diagnose problems on the virtual machines, Cisco says.

Nexus 1000V is also integrated with other Cisco products so their features can be applied to virtual machines. The virtual switch will support three virtual network services products at launch. First, Virtual Security Gateway provides zoned security policies for multi-tenant virtual environments. Second, Virtual Wide Area Application Services supports accelerated application performance for applications hosted on virtual servers in data centers and private clouds. Third, Network Analysis Module grants visibility into the virtual environment for troubleshooting performance problems.

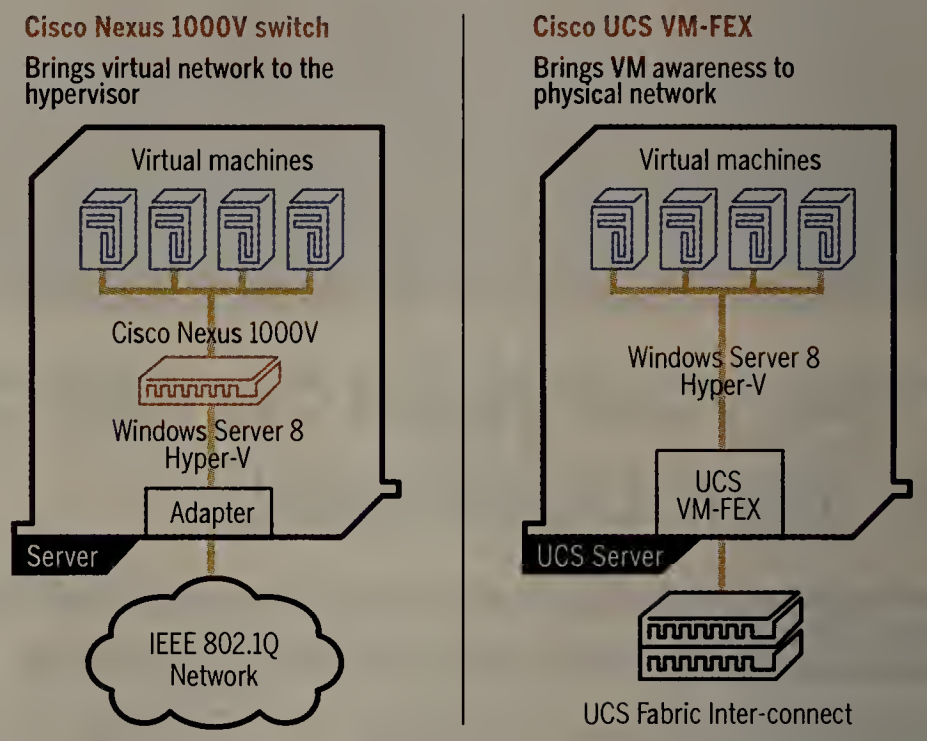
The second alternative Cisco will offer for gaining better visibility into Hyper-Vis a new version of Cisco Unified Computing System Virtual Machine Fabric Extender, which extends Cisco management to virtual environments. The benefit is similar to that of Nexus 1000V in that it gives a network-layer view and controls of the virtual environment, Cisco says.

With UCS VM-FEX administrators can treat the physical and virtual elements of their networks as a single infrastructure for provisioning, configuration, management, monitoring and troubleshooting.

Cisco says pricing isn't available yet for the new products. ■

Cisco's two switching options for Hyper-V

Cisco and Microsoft are collaborating on options that give Cisco gear greater visibility into Hyper-V virtual environments. They involve Cisco's Nexus 1000V virtual switch and its Unified Computing System (UCS) Virtual Machine Fabric Extender (VM-FEX) as shown below.



NETINSIDER |
BY SCOTT BRADNER

Internet privacy: Cookies as a weapon

IN NOVEMBER 2009 the European Parliament approved a directive on Internet privacy that, among other things, required user opt-in before websites could install cookies on the user's computer.

In theory, any U.S. company running a website that may be used by any citizen of any European Union country would have to follow the rules or risk being brought up on charges by an EU country.

Over the past two years many EU member states have passed legislation implementing the directive, but the specific requirement for cookie opt-in has remained confusing. The Justice Department of the European Commission has tried to figure out just what might constitute opt-in in the context of the directive. The primary group working on the issue has been the Article 29 Working Party.

That group's members recently met with European advertisers who would like to use more of an opt-out approach by maintaining that users who agree to visit a website are, by their action, opting in to the website's practices. The Working Party seems to disagree and wants instead a clear opt-in process.

This could be more than a little disruptive: Imagine a pop-up window asking if it is OK to store a cookie for each of the sites that wanted to put a cookie on your machine.

The U.S. has mostly met the requirements of the EU privacy rules by implementing the Safe Harbor framework. U.S. companies can self-certify that they meet the EU rules when dealing with EU customers (but do not need to provide similar protections for U.S. customers). Some 3,000 companies have self-certified. The frameworks will need to be updated when the cookie rules have been finalized.

In any case, the Safe Harbor is a good way to cover your butt if you are doing business in Europe or with European customers.

The Safe Harbor makes clear is that the U.S. does not have any meaningful privacy protection laws when it comes to the data that Internet companies collect about all of us. The Federal Trade Commission has been looking into the issue and has asked for responses to questions in this field.

Congress is looking at the issue as one of personal freedom for advertisers rather than anything to do with the privacy of Internet users.

The Subcommittee on Commerce, Manufacturing and Trade of the House Energy and Commerce Committee recently held a hearing on "Internet Privacy: The Impact and Burden of EU Regulation." The hearing was just a bit one-sided.

One of the committee members, Rep. Pete Olson (R-Texas), said he wanted to "use today's hearings to look at how the EU's overly burdensome privacy laws have negatively affected the European Union economy. Only one of the witnesses had anything even neutral to say about the EU rules.

The tone was set by Rep. Cliff Stearns (R-Fla.), who asked the witnesses, "Is there a demonstrated harm to consumers for being tracked online for behavioral advertising?"

I guess all must be OK unless someone can prove they have been hurt by their personal data wandering all over the country. As you might predict, the witness representing the Consumer Data Industry Association invoked protecting against terrorists and child abusers as rational for the ad industry being able to collect any information it can.

The subcommittee seemed to be operating on the premise that complaining about the EU rules will make them go away.

Disclaimer: Wishing things away by complaining may be a common reaction of students to pending exams but Harvard has provided no opinion on the current or pending EU rules, so the above observation (and lament) is mine alone. ■

Bradner is Harvard University's technology security officer. He can be reached at sob@sobco.com.

Patent madness: A timeline of the Android patent wars

BY BRAD REED

HISTORY MAY look at Android as the tech industry's Helen of Troy: The OS that launched a thousand suits.

Every week seems to bring new lawsuits and countersuits revolving around software patents allegedly being infringed upon by Android-based smartphones and tablets. Here's a timeline that chronicles what companies have sued Android vendors and how Google has tried to counter such suits.

March 2010: Apple files a lawsuit against HTC for allegedly infringing on 20 Apple patents. At the time Apple says the patents in dispute relate to the iPhone's patented "user interface and the smartphone's underlying architecture and hardware."

April 2010: Microsoft reaches a licensing agreement with handset manufacturer HTC to pay royalties to Microsoft in exchange for the right to sell Android-based devices. By this time Microsoft has also started negotiations with Android vendors such as Sony Ericsson about potential licensing deals.

August 2010: Oracle files a patent-and-copyright infringement suit against Google over the use of its Java programming language in Android.

October 2010: Microsoft takes off the gloves and sues Motorola for selling Android-based phones that allegedly infringe upon Microsoft patents. Microsoft general counsel Horacio Gutierrez says that some of the patents in dispute relate to Microsoft Exchange ActiveSync while others relate to on-screen displays for signal strength and battery power. Microsoft also buys dozens of smartphone patents formerly owned by Palm, further strengthening its smartphone patent portfolio.

November 2010: Vertical Computer Systems files suit against Samsung and LG over alleged Android patent infringements.

March 2010: Microsoft files suit against Barnes & Noble over its use of Android as the operating system of its Nook e-reader.

June 2010: Two minor hardware players, Velocity Micro and General Dynamics, come to terms with Microsoft on a licensing agreement similar to the one Microsoft and HTC forged more than a year prior.

July 2010: Google's headaches continue to mount as the company loses its bid to obtain valuable patents formerly held by Nortel to an industry consortium that included Apple and Microsoft. And Google doesn't just lose, it loses badly as its initial bid of $900 million for the patents is easily bested by the consortium's final winning bid of $4.5 billion. In all, Nortel sold more than 6,000 patents that covered technologies such as 4G wireless, data networking and voice.

And the bad news for Google keeps rolling in from there as HTC loses in the International Trade Commission's (ITC) initial ruling in its dispute with Apple. If the ITC's judgment is made final later this year it could mean a ban on importing HTC's Android phones into the U.S.

The one bright spot for Google during the month is its acquisition of more than 1,000 patents from IBM that bolsters its overall patent portfolio, but that doesn't do much to blunt lawsuits against Android vendors since the patents mainly cover the architecture of memory and microprocessing chips rather than mobile operating systems.

August 2010: Google pays $12.5 billion to acquire Motorola Mobility and its extensive portfolio of around 24,500 patents. Google CEO Larry Page says the company's foray into the patent wars will benefit its Android partners since the company is still dedicated to keeping Android an open mobile operating system.

"Motorola will remain a licensee of Android and Android will remain open. We will run Motorola as a separate business. Many hardware partners have contributed to Android's success and we look forward to continuing to work with all of them to deliver outstanding user experiences," Page emphasizes.

This still doesn't slow down worldwide patent suits against Android vendors, however, as Samsung agrees to not sell its Android-based Galaxy Tab 10.1 in Australia until it resolves a patent dispute with Apple and a Dutch court issues an injunction ordering the immediate halt of sales for Samsung's Android-based Galaxy smartphones.

September 2011: Samsung claims it will block sales of the iPhone 5 whenever it goes on sale in Samsung's native Korea. According to a report in the *Korea Times*, Samsung will sue Apple for alleged patent infringements against its wireless technology-related patents. ■

TOOLS

QNAP, hooray! 2Wire, boo!

"Currently 2Wire does not support Universal Plug and Play (UPnP). 2Wire customizes all gateway products and software to meet the requirements of our ISP partners. If supporting UPnP became a requirement, 2Wire will include the functionality to the system. UPnP allows the OS to control the firewall configuration that could have an adverse effect on any systems running behind a firewall that is being controlled by malicious software operating on a LAN-based computer."

Mark Gibbs' Gearhead

Tell me, who writes this stuff? The above is quoted from 2Wire's so-called Gateway Product Support page that you get to by clicking on the Help link on the management interface of a 2Wire 2701HG-B Gateway as supplied by AT&T. Yes, I know it's an old model (really slow with some horrible user interface bugs), but these devices are still out there by the thousands so they are, unfortunately, relevant.

What is so annoying about this "explanation" (other than the text being written by someone who was obviously semi-literate) is they don't just come out and say "no"; they beat about the bush, push the issue in the direction of the ISP, and then imply it's a bad idea altogether. Really? Shame on you, 2Wire.

> ...they beat about the bush, push the issue in the direction of the ISP, and then imply **it's a bad idea altogether.**

Anyway, I stumbled across this nonsense while setting up a new toy, er, product here in the Gibbs Universal Industries Secret Underground Bunker, a QNAP TS-1079 Pro.

The QNAP TS-1079 Pro is a network-attached storage (NAS) device with 10 SATA drive bays that can provide up to 30TB of storage in an office-friendly package. I say "office friendly" because its noise emission is rated at a reasonable 30db in the configuration I have, which is with 10 1TB drives.

Powered by a Dual Core Intel Core i3-2120 3.3 GHz processor with 2GB DDR3 RAM, the QNAP TS-1079 Pro comes with two 1 Gigabit Ethernet ports as standard, two USB 3.0 ports, four USB 2.0 ports and two eSATA ports. Roughly toaster-oven size (9 inches high, 13 inches wide, 13 inches deep) it consumes (again, in my configuration) 121 watts in operation and 40 W on standby.

You can configure the QNAP TS-1079 Pro to be a single giant disk volume, a number of single disk volumes, a single RAID 0 striping disk volume, one or more RAID 1 mirroring disk volumes, a RAID 5, 6 or 10 disk volume.

So, where to begin with features? This is tricky because this system is loaded.

Perhaps a good place is the reason I was checking to see if my Internet gateway was UPnP-enabled: This was because the TS-1079 supports a service called MyCloudNAS.

MyCloudNAS is essentially a Dynamic DNS service (DDNS) that allows you to publish and access applications running on a QNAP NAS system on the Internet. You register whatever subdomain name you like on MyCloudNAS, configure your QNAP device and voila! Your remote users can access your NAS-based apps.

Next week, we'll delve into more detail on the QNAP TS-1079 Pro. In the meantime, after careful prodding of the wretched 2Wire product, it looks like I'll have to replace the gateway. For some reason it doesn't know anything about the QNAP device, and if the gateway can't see a machine on your network, then you're out of luck as there's no way to tell the gateway to enable port forwarding for that address! Who was the numbskull who thought that was a good idea? ■

Gibbs rages in Ventura, Calif. Your ire to gearhead@gibbs.com.

PARITY BITS

50%

Workloads that will be virtualized by the end of 2012.

SOURCE: GARTNER GROUP (AS QUOTED BY HP)

GADGETS

Jawbone adds a 'Nerd' to its cool Bluetooth headsets

Keith Shaw's Cool Tools

THE SCOOP

Icon HD + The Nerd

by Jawbone, about $140

▶ **What it is:** The Jawbone Icon HD is a Bluetooth headset designed for your mobile phone with NoiseAssassin 2.5 software to create great-sounding phone calls from your end (that is, the recipient hears no noise; you may still hear some from their end). The Nerd is an extra USB dongle that can be attached to a PC or Mac, providing a wireless Bluetooth headset for computer-based VoIP applications (Skype or other unified communications software). In addition to providing audio for phone calls, the headset can stream audio from your mobile phone or computer for when you're not on a call.

▶ **Why it's cool:** The addition of the Nerd USB dongle makes this ideal for users who want a Bluetooth headset for their cellphone, but then want to use the same headset for VoIP calls on their computer, instead of investing in a separate headset. Like other headsets of its ilk, the Icon HD seamlessly switches between streaming audio and incoming calls, pausing the music to let you take the call, then returning to the music after the call is finished. It's also nice to have different fitting options — the package comes with seven earbud sizes, as well as a plastic earloop that can fit behind the ear for a more snug fit. In my tests, the earbud-only option worked just fine — I didn't need to worry about it falling out if I tilted my head.

I loved the addition of an on/off switch on the Icon HD — it saves a lot of battery life for when you're not using the headset. The HD technology made for great audio quality on cellphone and Skype calls, and really enhanced music streaming from my iPhone; it only suffered slightly when streaming from the PC via the Nerd dongle.

And my callers are very appreciative of the noise cancellation features, which means I don't have to shout when I'm in a noisy environment like my car or the airport, where I'm doing the bulk of my cellphone calls. Bravo!

▶ **Some caveats:** The power adapter has a very short USB cable — if you use a wall outlet, you may forget that the headset is attached to it (I prefer longer cables that let you move the headset away from the wall outlet). While pairing the headset with my iPhone was extremely simple, I had more difficulty pairing with the Nerd USB dongle, bringing me back to the early days of hitting buttons in the proper order and before time ran out on the pairing. Also, I preferred the voice activation feature on my Plantronics headset (the Savor M1100), which lets me answer an incoming call by saying "Answer"; on this headset, when an incoming call comes in, I needed to press the "talk" button on the phone. But that's a really minor quibble.

▶ **Grade ★★★★ (out of five).**

Shaw can be reached at kshaw@nww.com.

The HD technology on the Jawbone Icon made for great audio quality.

Enterprise WAN connectivity: MPLS vs. public Internet

MPLS VPN: The network of choice

Peter Konings, director of product marketing for enterprise global WAN services at Verizon

MULTIPROTOCOL LABEL SWITCHING VIRTUAL PRIVATE NETWORKING is synonymous with high reliability and quality, which is the primary reason IDC says MPLS VPNs continue to show remarkable growth across all company sizes and vertical segments. It has become the linchpin of corporate enterprise networks.

A private MPLS VPN network delivers the highest reliability, agility, visibility and simplicity for connecting a global enterprise's complex and highly distributed ecosystem of employees, customers and partners.

Let's start with the reliability question. Every company must ask how critical network performance and quality are to its business strategy. Whether it's an extended enterprise with locations around the globe or a local business, most companies will determine that a secure, robust and efficient communications infrastructure is a requirement for competing in today's always-on global economy.

Companies that provide private MPLS networks, such as Verizon, will typically commit to 100% availability of their core network, but will also put in place rigorous quality and process demands on the local access partners they use so the end-to-end quality can actually be guaranteed upfront.

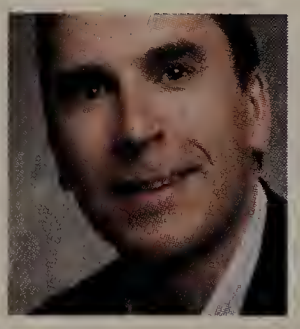
The reliability factor, however, is only the baseline for ensuring that an underlying technology will be deemed the standard bearer of corporate networks. The more challenging issues are driven by quality elements — e.g. latency, packet loss, mean opinion scores, etc. — that are essential for successful transport of applications.

Consider, for example, the convergence of data, voice and video, which has been a primary driver of the MPLS VPN market because of MPLS' inherent ability to prioritize traffic and ensure consistent performance. Customers that rely on their MPLS VPN for converged communications need the ability to optimize the use of these resources without compromising quality, which is where visibility comes into play.

Complete visibility into a corporate network is a

► *See* **Verizon,** *page 22*

MPLS will succumb to Internet economics



Keith Morris, VP of marketing at Talari Networks

THE INTERNET IS FAST, CHEAP and abundantly available. The competition among service providers ensures it will get faster and cheaper on a cost-per-megabit basis, and become available in more places.

Private WANs using MPLS or leased lines look very different economically. In the United States, MPLS pricing ranges from $350 to $700 per megabit per month for 1.5Mbps of bandwidth. Internationally, locations pay as much as $5,000 per month for a 2Mbps connection. Yet, consumers buy high-speed Internet connections boasting 20Mbps or 50Mbps of connectivity for as little as $4 per megabit per month.

Why are businesses willing to spend a fortune on services like MPLS when cheap Internet is abundantly available?

Until now, the only way to get reliable connectivity with predictable performance was to buy leased lines or a service like MPLS. Enterprises require the 99.99% (four nines) reliability that MPLS offers with quality of service features to ensure VoIP calls are prioritized over data traffic.

Basic Internet connections, on the other hand, don't support QoS and are not four-nines reliable; they are about two nines, or 99%. Reliability, in this context, means availability of the network and also that packets actually reach their destination without being delayed or dropped.

The emergence of WAN virtualization technology, however, means public Internet can give MPLS a run for its money. How is this possible?

WAN virtualization solves the Internet's problem of network peering points becoming choke points where congestion and packet loss randomly occur, and where there is a single point of failure because there's only one connection at each location. How? By using two or more network connections at each location and monitoring precisely the one-way performance of every path between locations.

This real-time, fine-grained information on loss, jitter, latency and congestion is used to make real-time traffic engineering decisions on a packet-by-packet basis, picking the optimal path based on

► *See* **Talari,** *page 22*

Which suite is right for you?

MPLS VPNs (48%)

WAN virtualization (52%)

718 votes

Cast your vote and see comments at tinyurl.com/3f9bcm3

▶ **Verizon,** *from page 21*

necessity, and customers have come to rely on MPLS tools for tracking and predicting actual usage and performance down to the bandwidth and application levels. This enables efficient troubleshooting and obviates the need to fix every problem by blindly throwing additional bandwidth into the network and hoping for the best.

That being said, when additional bandwidth is the answer, MPLS networks are dynamic enough to allow customers to allocate it as needed or to change classes of service settings to accommodate regularly recurring events, such as a weekly SAP backup.

Today, with enterprise mobility and cloud computing adoption on the rise, the application landscape is rapidly evolving. Whether an enterprise centrally hosts its applications or not, the key to a successful computing environment depends on the accessibility and security of applications and data, all of which rely upon the quality and security of the network.

A recent report by research firm Ovum titled "Cloud Computing: What's the Network got to do with it?" put it well: "We think the network is an essential part of telcos' value propositions as cloud computing applications move from public IP, with no QoS or SLA guarantees, to trusted networks."

Indeed, the need for cloud applications to communicate effectively over the WAN will become increasingly critical in network selection, a fact that plays to the strengths of MPLS VPNs.

The quality, reliability, flexibility and simplicity of MPLS VPNs is a perfect complement to the emerging cloud-driven computing world, so much so that MPLS services will become analogous to the electric grid. That is, always on and operating reliably, yet invisible, to the point that when cloud customers ask themselves what the network has to do with it we will argue ... everything. ■

Verizon Communications is a global leader in delivering broadband and other wireless and wireline communications services to business, government and wholesale customers.

▶ **Talari,** *from page 21*

current traffic conditions and the type of traffic.

This effectively addresses Internet weaknesses by providing physical diversity in the first- and last-mile, and detecting and avoiding congested peering points. WAN virtualization detects and mitigates problems by moving traffic from one path to another sub-second. This is an order of magnitude faster than routing protocols can move from a broken MPLS link to a backup MPLS connection or IPSec VPN.

The result is an adaptive network where application sessions don't break, VoIP calls don't drop, users experience predictable performance, and IT staff sleeps soundly because a network failover works transparently and reliably.

Because Internet connections are typically faster and cheaper than MPLS circuits, WAN virtualization results in a more reliable and predictable network, as well as one with more bandwidth today — plus the flexibility to add more circuits or leverage newer access technologies as they become available.

If you are reading this after recently signing a three-year MPLS contract, don't despair; WAN virtualization can be used to augment existing private WANs lighting up your backup circuits, making your connections active-active. Eventually, you can cap, reduce or eliminate MPLS at some or most of your sites.

It appears inevitable that MPLS will ultimately succumb to Internet economics as businesses cap their spending on expensive bandwidth by adding more Internet connectivity, and in some cases, eliminating MPLS at some or all of their locations. ■

Talari Networks' WAN virtualization solutions bring Internet economics to corporate WANs by transforming Internet links to deliver business-class performance. Morris can be reached at kmorris@talari.com.

Send Debate Suggestions to jdix@nww.com

The cost-efficient solution

While MPLS offers a great QoS, it's cost prohibitive when trying to continually add bandwidth to your WAN. It seems that WAN virtualization offers a more cost-efficient solution for enterprise-level organizations. **JOHN MCLAMB**

MPLS still needed

The Internet works for most data applications, but for video conferencing it's a do-you-feel-lucky scenario. MPLS, IMHO, is still needed for voice and video and until there is a true end-to-end way to manage traffic on the Internet, MPLS still rules. **LOU CHIORAZZI**

Ditching MPLS

We migrated 13 of our locations to Talari, ditching MPLS. This infrastructure has been running successfully for quite some time. Reliability has been very good. Cost savings are substantial, which is important for us as a government agency. None of our sites ever noticed a change from MPLS. Which include VoIP. I would recommend having some properly trained network staff though.

Here is a recent article regarding our project: tinyurl.com/483tr7z. **JMULHALL**

Performance and control

With MPLS, you control the routing policy between sites, or at least have a definite relationship with your provider's end-to-end. With the Internet you are at the mercy of re-peering arrangements between Internet carriers. These change without notice, and sometimes, without recourse.

Only advantage of an Internet solution is that it is relatively cheap. If performance and control are important, MPLS is the better choice. **ALAN JULIAN**

Skeptical of public Internet

Back in 1998 my CIO asked about using the Internet for Far East office connectivity. I cautioned that I did not feel the Internet was ready regarding consistent performance, reliability and security. I ordered a managed frame relay network and the local loops still proved to be challenging.

The Internet faces the same challenge only there is no one to call and order it "fixed." I remain skeptical due to these issues, but can see Internet VPNs being used in cities where local loops and Internet long hauls are more reliable. **TIMOTHY R. LOFTUS**

Monnie McGaffigan
VICE PRESIDENT OF SPRINT'S WIRELINE SERVICES

Vice President of Sprint's Wireline services, including international sales and alliance partnerships, McGaffigan and her team are responsible for coordinating Wireline platform strategy and providing sales and operations support of a $4.3 billion line of business. She brings more than 20 years of communications and leadership expertise to her current position.

FOR MORE INFORMATION:
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Managed Network Solutions:

Partner-provided secure, reliable communications lets business focus on business

Give us an overview of Sprint's vision of what comprises Managed Network Solutions.
We define Managed Network Solutions as a communications-centric subset of packaged offerings that provide day-to-day, operations-focused management functions tied to specific network and network-related technologies.

Our vision is to provide a holistic approach to help businesses evolve their technology platform. Our portfolio includes planning, design and implementation services, and solutions from simple monitoring to full end-to-end support, managed firewalls, managed WAN acceleration and managed IP telephony. We also have a group dedicated to cloud consulting services to complement traditional managed router services.

It is important to note that security is tightly integrated at every level of the network. We want to underscore white-glove customer support and strong SLAs developed through a deep understanding of the impact of convergence on networks. We have been doing this for more than 25 years, and have participated in the migration of businesses to IP-based services and the convergence of voice, video and data.

Why is this important to organizations today?
Enterprises are seeking new and innovative ways to keep up with technology and grow their business without being diverted from their core product and services. With limited resources, engaging a trusted partner to take on less strategic activities becomes a logical next step.

Of course, that mandates an efficient network design that sends business-critical information reliably and securely, to reduce delays and lost business. Companies want to increase productivity and keep branch and remote offices, plus an increasingly mobile workforce, connected.

Finally, multinational companies face increasing complexities and need legal and regulatory expertise to deal with security and other issues of managing a worldwide network.

What are the business drivers of MNS?
Businesses are operating with constrained budgets. A strong MNS partner can help improve operational efficiencies, reduce capital expenditures and allow IT to focus on their core, strategic competencies. MNS can enable IT to be more nimble and flexible, and to deploy new applications easily.

What are the IT drivers?
There is enormous pressure on IT to deliver a good customer experience both internally and externally, so meeting end-user expectations is the primary driver. IT generally looks to managed solutions when they need to streamline operational support requirements and to transfer technology risk and capital investment.

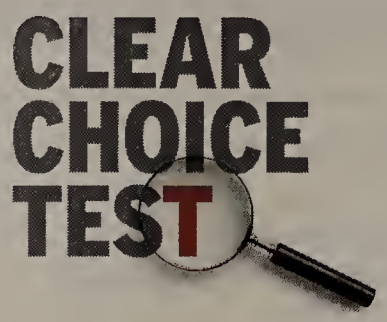
Talk about the most often realized benefits of this strategy.
The greatest benefit is the ability to quickly deploy resources to focus on core competencies and critical projects. Most companies are not adding personnel in the current business climate, however they do not want to lose out on technology enablers. This strategy allows a company to put those enablers into the hands of a trusted partner. A few years ago, IT didn't want to let go of management—they were anxious about it. But there has been a huge shift in the tides. Managed solutions are the ideal way to mitigate technical obsolescence, and gain greater business agility.

What are the key considerations an IT leader needs to keep in mind when evaluating a Managed Network Solution?
There are three: Customer service, technology and value. We hold ourselves to the highest standards in our relationship with customers and our end-to-end accountability. Businesses should also have access to a self-service management portal that provides visibility and transparency to the health of their network. With technology, the portfolio has to give customers more than they could do themselves, and meet the future needs of their business. Finally, the ROI has to make sense. The business has to be able to reduce costs through efficiencies.

Splunk explains it all

Enterprise-class product devours security log data and delivers powerful analysis

BY JOEL SNYDER



If there's gold in log files, Splunk Inc.'s Splunk Enterprise will help you to find it. Splunk bridges the gap between simple log management and security information and event management (SIEM) products from vendors such as ArcSight, RSA, Q1 Labs and Symantec.

Splunk lets you gather log data from systems and devices, and run queries on that data to find issues and debug problems. Splunk's capabilities also include reporting and alerting, pushing it every-so-slightly into the world of SIEM.

What separates out Splunk from the world of Syslog servers and SIEM tools is Splunk Apps, a library of nearly 200 add-ons that make Splunk better at understanding and analyzing log information.

We found Splunk to be a powerful, if complicated, tool. Network managers who look at their logs every day, and those who wish they could get useful performance, capacity, and security information out of the gigabytes of log data stacking up should take a close look at Splunk.

Getting started with Splunk

There's a free version of Splunk for small and midsize deployments, so if your log files don't add up to 500MB each day, Splunk can be yours for the cost of the server you run it on. Some features, such as alerting, role-based access control and distributed searching are not available in the free version; you also can't run premium applications on top of the free version.

But Splunk is designed to scale up — way, way, up. With distributed search databases, role-based access control and the ability to eat terabytes of log data each day, Splunk is aimed at the large enterprise.

Splunk wants to be fed everything, including system, Web, security and every other type of log or performance data you can find. We didn't want to go quite that large, so we tested using Splunk on our own small data center, using live data.

Getting data into Splunk follows the same paths as any log management solution. We set up Splunk on a Linux system (Windows and other Unix flavors are also supported), a simple matter of an RPM installation, and had it listen for data sent to it with Syslog, probably the most common way to get your log data off systems and into an analysis tool.

For Windows systems, Splunk provides its "universal forwarder," an application that will pull Windows WMI data and forward it off to a Splunk server. The universal forwarder can also monitor file systems for changes and forward data from remote systems back to a central Splunk installation. We only used it to pull Windows event log information.

Splunk isn't too particular about where and how it gets data, with options for scripting and other network input sources.

Our initial contact with Splunk's input system, however, gave us a pretty good feel for Splunk's operational style. Splunk is not a do-it-yourself piece of open source software, but it also doesn't have the smooth polish we have seen from other commercial products. Splunk has an internal complexity that the Splunk team is happy to share with everyone through an extensive online documentation system.

If you want to make Splunk work, you've got to be ready to abandon the slick GUI and dive deep into difficult technical configuration, editing configuration files, writing regular expressions and taking the time to understand where your data are coming from and how Splunk will see them.

We got Splunk working very smoothly in our multi-vendor environment, but only after investing serious effort in understanding how Splunk collects and indexes data. Our installation is slightly complicated, because we already have a central Syslog server that resent the log data over to Splunk for indexing. But in these days of compliance and audits, having centralized Syslog for archiving purposes doesn't seem that unusual.

Overall, getting data into Splunk is hard, with a confusing maze of pointers, wikis, product tech notes and documentation, but backed up by Splunk's technical support staff.

Getting information out of Splunk

If getting information into Splunk takes awhile, getting information out of Splunk is a breeze, and can be fun to boot. Splunk has intentionally copied the Google minimalist search bar, and to find information you just start typing into a large box, select a time range and click the green "go" button.

Immediately, log entries that have the text you typed begin showing up, while the query continues to run in the background if you selected a particularly wide time range.

But this isn't just your normal text search. Start typing in the search bar and pause for a moment. Splunk creates a drop-down with the most frequently found terms in your logs that contain what you've typed so far, along with the frequency counts.

The other thing that Splunk has copied from Google is speed. This log search is fast. We tested Splunk for two months on a very modest hardware platform: a single-core, 2.3 GHz speed virtual machine with 1GB of memory, dropping in about 30 million log entries. Every standard search, even using regular expressions, returned the first screen of data within one or two seconds. If you're looking for something, Splunk is not going to get in the way of finding it.

Not every search is lightning fast; some are merely speedy. For example, we ran a search asking for the most common access point names coming out of our Aruba wireless controller. That search took 19 seconds to

NETRESULTS

Product	Splunk Enterprise 4.2
Company	Splunk Inc.
Pricing	Free if you index less than 500MB per day. Splunk Enterprise starts at $5,000 and includes more capabilities and a higher level of support.
Pros	Easy to get started and build knowledge about your logs; many applications from Splunkbase increase analysis capabilities quickly; well-designed interface reduces training costs and enables occasional use without stress; lots of capabilities to log from sources other than Syslog and Windows event log.
Cons	Integration with existing Syslog infrastructure opaque; administrative interface and product debugging poorly thought-out; log archiving features missing.

summarize the 31,942 records from the Aruba controller, giving us the most common values, sorted by frequency.

Since we didn't even try to optimize the performance of the Splunk server, this snappy response on low-end hardware was a great surprise. Splunk specifically discourages using virtual machines for performance reasons, but dedicating a physical server to log management doesn't seem necessary unless your volume is dramatically higher, into the gigabytes per day range.

Simply searching for text in log entries doesn't even scratch the surface of what Splunk searches can do. The search manual is 289 pages long, and starts with Splunk's idea of the top search commands you have to learn. That top list has 23 commands, ranging from the easy-to-understand "search," "sort" and "top," to the incredibly interesting "rare," "dedup" and "transaction" (which groups log entries into a single transaction), to the confusing and difficult-to-use "xmlkv" and "bucket."

Fortunately, Splunk is like Excel: Getting started and getting simple results on both is easy, with frequent use making you a real wizard at manipulating data. Network managers who only dig into their logs once a month will not become Splunk experts, and won't find the cost of managing Splunk worth the benefits.

However, if you use your logs frequently, or want to get even more information out of the logs you have, taking the time to get good at Splunk is probably worth the investment.

Reporting and alerting

Splunk can generate a variety of reports, including simple graphs (such as pie charts or bar charts) as well as textual, tabular reports. Compared with other common reporting tools, Splunk's reports are fairly basic.

The underlying tools for generating reports out of Splunk are great. Everything from time charts to rare events to statistics to frequencies and correlations are possible. Reporting is aimed at the GUI interface as the main tool for viewing and consuming report data. Each report shows up in a dashboard, giving the viewer great options for customizing, drilling down into data and changing time frames and data sources.

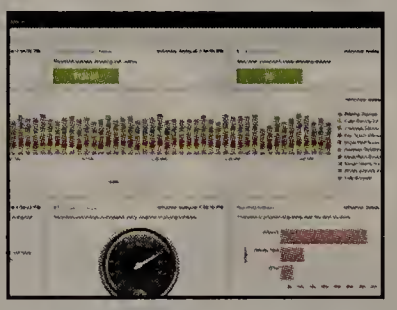
Getting those dashboard views into traditional reports, though, is hard in Splunk. You can simply generate PDFs from the screen reports, and even do it on a schedule. But complex reports, especially multi-part ones with the sorts of decorations that auditors have come to expect, are not strengths of Splunk.

Alerting, available only in the premium version of Splunk, is not a particularly strong feature. If you are looking for alerts as a major part of your log management system, Splunk probably won't fit the bill. Alerts can only be generated based on standard Splunk queries, so any relationship between alerts or dependencies will be either difficult or impossible to express in Splunk's alerting system. Once you define the alert, you can send it off via email, RSS feeds or a script.

Reports, in the form of dashboards and visualizations of your log data, are a powerful part of Splunk and valuable tools. Traditional reporting and alerting, such as you might find in a SIEM, isn't what Splunk is about.

Making Splunk smarter with apps

Splunk doesn't just index log data; it makes a valiant attempt to parse the log data. We discovered that the more time you put into teaching Splunk what kind of log data you're feeding it, the more Splunk can parse and report on information within the logs. You can do this by yourself, building search strings and regular expressions, adding tags and so on, which is what we did to make Splunk understand our Aruba wireless network. But there's an alternative, the most interesting parts of Splunk, and its biggest differentiator: the add-on library of applications called "Splunkbase." Many, but not all, of the applications in Splunkbase are free.



Splunk can generate a variety of reports, including simple graphs and tabular reports.

Splunk is pushing hard on applications, probably because they understand that applications are the key to the future of their product. In fact, the basic search tool in Splunk has been moved into a pre-installed application called Search. This makes it clear that applications are not just add-ons, but the main way you'll interact with Splunk.

The applications in Splunkbase run the gamut, but two examples that we tested give a good idea of the power. Since we have both Sourcefire Snort IPS and Cisco IronPort antispam devices in our network, we directed their logs to the Splunk server and installed the free associated Splunk applications. In both cases, the applications helped to more precisely parse the log information coming out of the devices.

For example, without the Snort application, we couldn't run queries on logs to differentiate between source and destination IPs in Snort events. With the Snort app installed, Splunk becomes smarter and you can query each type of address separately. Same for the IronPort logs: Without the add-on IronPort application, we couldn't differentiate "From" and "To" email addresses in our searches.

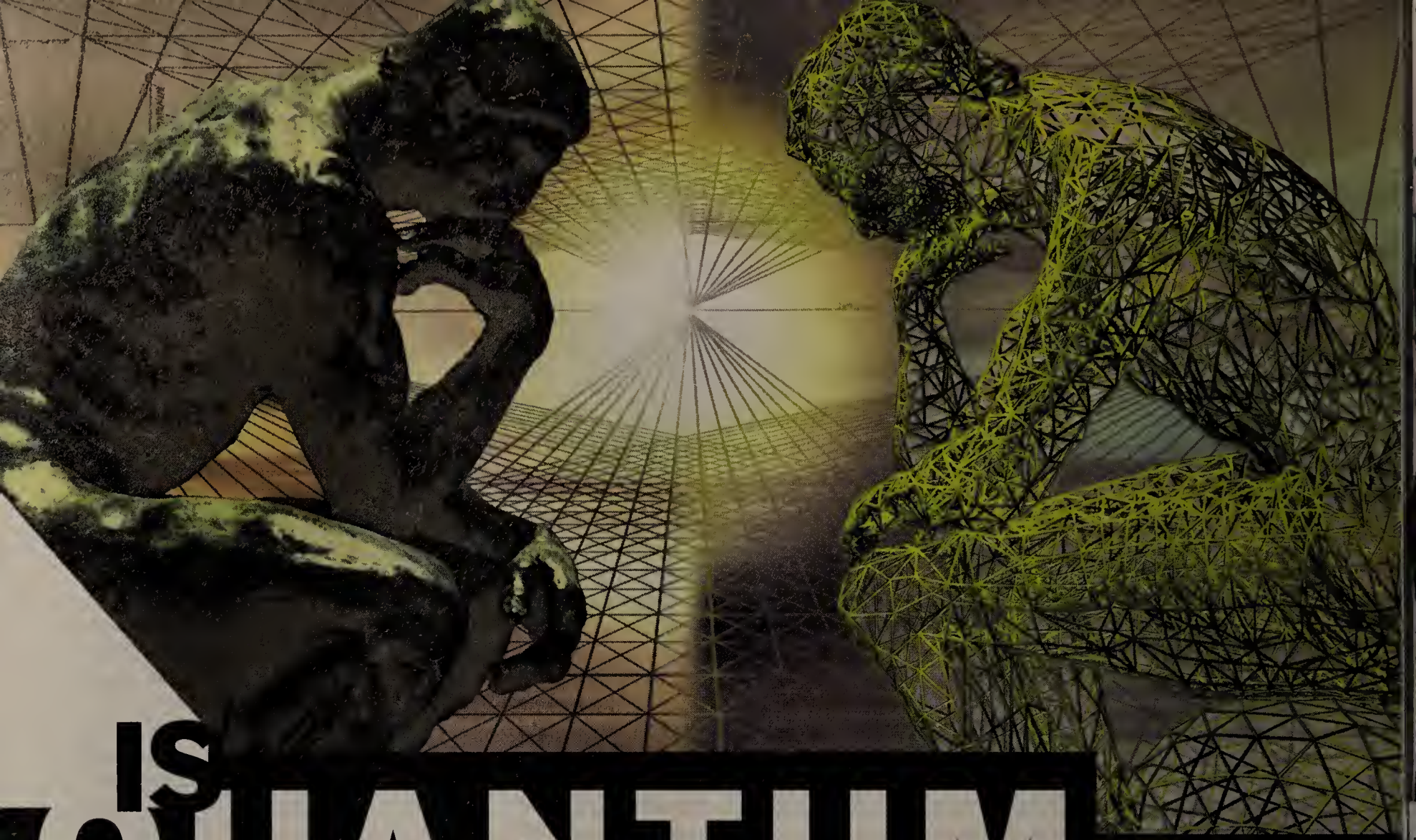
Smarter searching is one feature of Splunkbase applications, but reporting and graphing is another piece that most of the applications we looked at include. For example, the IronPort application came with reports to give us top senders and top receivers. The Snort application gave us a dashboard with automatically built "top 10" reports, as well as a map-based view showing where the attackers blocked by our IPS were located.

The applications in Splunkbase fill some, but not all, of the gap between the command-line techie-friendly searches you get out-of-the-box and what network managers have come to expect from modern applications. Of course, it all depends on what enterprise applications you have running. For example, Splunk has developed a free Splunkbase application with extensive hooks into Microsoft Exchange. If you're running Exchange, that's great. If you're on Domino, recreating that value won't be easy.

The lack of a Splunk application that matches your enterprise mix shouldn't be a show-stopper. For example, the Snort application we downloaded had 105 files in it, but 90 of those were related to the mapping part of the application. The IronPort application was just as simple, about 15 files (no maps this time) to do what was needed. It only took us a few hours to dive into these applications, read through the source code, understand what was going on and modify them for other tools on our network (a Trend Micro antispam gateway and a Juniper IPS sensor).

The Splunkbase applications are the magic dust that makes Splunk truly stand out from other log storage and analysis tools. Without them, it's a hard-to-use and hard-to-learn search engine. With them, and the extensions that they enable, Splunk can shoulder away both open source and commercial competition and become the standard for log analysis. ■

Snyder, a Network World Test Alliance partner, is a senior partner at Opus One in Tucson, Ariz. He can be reached at Joel.Snyder@opus1.com.



IS QUANTUM COMPUTING REAL?

THE ANSWER IS YES AND NO AND YES AND YES AND NO AND NO.

BY JULIE SARTAIN

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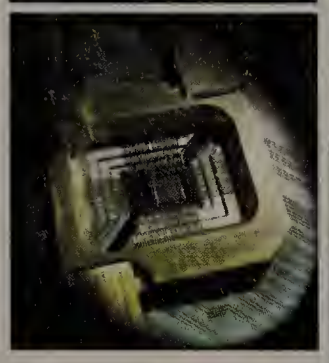
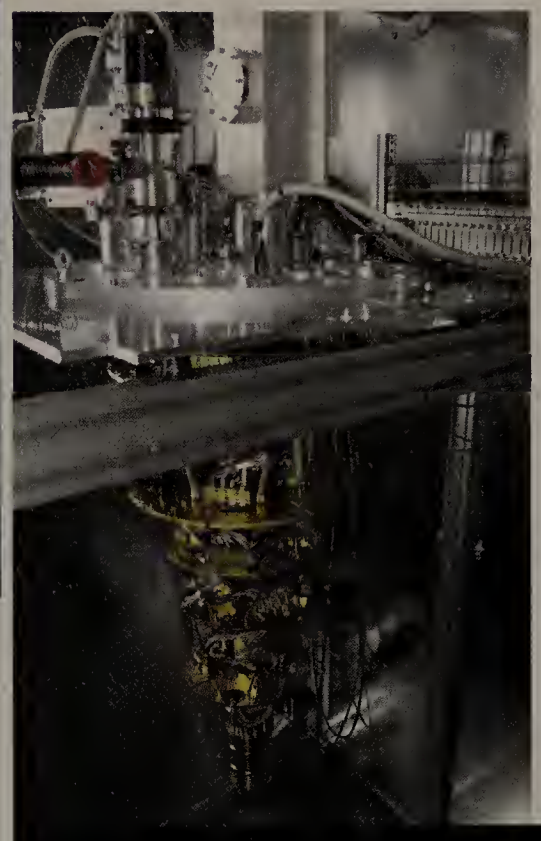




STARTING FROM TOP LEFT: Quantum motherboards are housed in special data centers. This control device monitors coolant gases. The processor and its packaging live in a dilution refrigerator, which cools the quantum computer to nearly absolute zero. The quantum equivalent of a motherboard.

Researchers have been working on quantum systems for more than a decade, in the hopes of developing super-tiny, super-powerful computers. And while there is still plenty of excitement surrounding quantum computing, significant roadblocks are causing some to question whether quantum computing will ever make it out of the lab.

First, what is quantum computing? One simple definition is that quantum computers use qubits (or quantum bits) to encode information. However, unlike silicon-based computers that use bits which are zeroes or ones, qubits can exist in multiple states simultaneously. In other words, a qubit is a bit of information that has not yet decided whether it wants to be a zero or a one.

In theory, that means that quantum systems can produce simultaneous processing of calculations; in essence, true parallel systems.

Olivier Pfister, professor of experimental atomic, molecular and optical physics at the University of Virginia, says quantum algorithms could deliver exponential advances in compute speed, which would be useful for database searching, pattern recognition, solving complex mathematical problems and cracking encryption protocols.

"But the roadblocks to complete success are numerous," Pfister adds. The first is scalability — how do you build systems with large numbers of qubits. The second is even more vexing — how do you overcome "decoherence," the random changes in quantum states that occur when qubits interact with the environment.

The first roadblock is an obvious one: quantum systems are microscopic. The challenge is to gain exquisite levels of control at the atomic scale, over thousands of atoms. To date, this has only been achieved on the order of 10 atoms.

"My work with optical fields has demonstrated good preliminary control over 60 qubit equivalents, which we call 'Qmodes' and has the potential to scale to thousands of Qmodes," Pfister says. "Each Qmode is a distinctly specified color of the electromagnetic field, but to develop a quantum computer, nearly hundreds to thousands of Qmodes are required."

Decoherence poses an even bigger roadblock. "All the algorithms or patents in the world are not going to produce a quantum computer until we learn how to control decoherence," says Professor Philip Stamp, director of the Pacific Institute for Theoretical Physics, Physics, and Astronomy at the University of British Columbia.

In the early days of quantum research, computer scientists used classical error correction methods to try to mitigate the effects of decoherence, but Stamp says those methods are turning out to be not applicable to the quantum world. "The strong claims for error correction as a panacea to deal with decoherence need to be re-evaluated."

According to Stamp, there are many experiments going on around the world in which researchers are claiming that they have built quantum information processing devices, but many of these claims dissolve when the hard questions about decoherence for multi-qubit systems are asked.

So far, the most sophisticated quantum computations have been performed in "ion trap" systems, with up to eight entangled qubits. But physicists believe that the long-term future of this field lies with solid-state computations; that is, in processors made from solid state electronics (or all-electronic devices that look and feel more like regular microprocessors), as opposed to atomic particles. This has not been possible using solid-state qubits until now because the qubits only lasted about a nanosecond. Now these qubits can last a microsecond (a thousand times longer), which is enough to run simple algorithms.

Quantum controversy

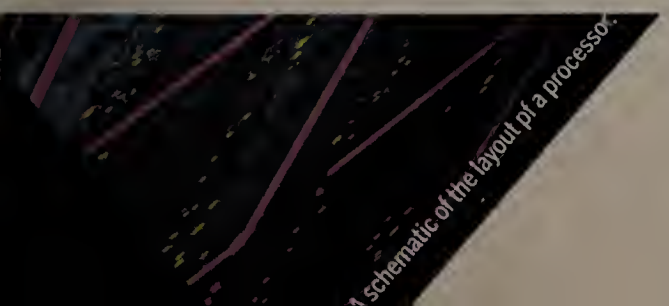
The most recent results showing very low decoherence for magnetic molecule qubits was recently published in *Nature International Weekly Journal of Science* by a team of researchers from the Vancouver-based company D-Wave Systems. D-Wave has performed a technique called quantum annealing, which could provide the computational model for a quantum processor.

Suzanne Gildert, Ph.D. from the University of Birmingham, experimental physicist, and quantum computer programmer (now working at D-Wave Systems), says that with quantum annealing, decoherence is not a problem.

According to Gildert, D-Wave uses Natural Quantum Computing (NQC) to build its quantum computers, which is very different from the traditionally proposed schemes. "Some quantum computing schemes try to take ideas from regular computing — such as logic operations — and make 'quantum' versions of them, which is extremely difficult. Making 'quantum' versions of computing operations is a very delicate process. It's like trying to keep a pencil standing on its end by placing it on a block of wood, and then moving the block around to try to balance the whole thing. It's almost impossible. You have to constantly work hard to keep the pencil (i.e., the qubits) in the upright state. Decoherence is what happens when the pencil falls over," Gildert says.

"In our NQC approach, which is more

ILLUSTRATION: JEAN FRANCOIS PODEVIN
PHOTOS: D-WAVE SYSTEMS INC



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scalable and robust, we let the pencil lie flat on the wood instead, and then move it around. We're computing by allowing the pencil to roll however it wants to, rather than asking it to stay in an unusual state. So we don't have this same problem of bits of information 'decohering' because the state we are trying to put the system into is what nature wants it to be in (that's why we call it Natural QC)."

But Jim Tully, vice president and chief of research, semiconductors and electronics at Gartner Research, says that what D-Wave is doing is not really quantum computing.

Tully says, "A sub-class of quantum computing has been demonstrated by D-Wave Systems that is referred to as quantum annealing, which involves superposition, but does not involve entanglement and is not, therefore, 'true' quantum computing. Quantum annealing is potentially useful for optimization purposes, specifically for the purposes of finding a mathematical minimum in a dataset very quickly."

There may be some dispute over whether D-Wave's approach is pure quantum computing, but Lockheed Martin is a believer. Lockheed Martin owns a quantum computing system called the D-Wave One. Lockheed is working on a problem known as verification and validation to develop tools that can help predict how a complex system will behave; for example, to detect if there are bugs in the system, which may cause equipment to behave in a faulty way.

Keith Mordoff, director of Communications Information Systems & Global Solutions at Lockheed Martin, says, "Yes, we have a fully functioning quantum computer with 56 qubits, which is different from the classical methods. D-Wave uses an adiabatic or quantum annealing approach, which defines a complex system whose ground state (lowest energy state) represents the solution to the problem posed. It constructs a simple system and initializes it in its ground state then changes the simple system slowly until it becomes the complex system. As the system evolves, it remains in the ground state, then measures the state of the final system. And this will be the answer to the problem posed. The change from simple system to complex system is induced by turning on a background magnetic field."

Future shock

Some scientists are extremely skeptical about quantum computing and doubt that it will ever amount to anything tangible.

Artur Ekert, professor of quantum physics, Mathematical Institute at the University of Oxford, says physicists today can only control a handful of quantum bits, which is adequate for quantum communication and quantum cryptography, but nothing more. He notes that it will take a few more domesticated qubits to produce quantum repeaters and quantum memories, and even more to protect and correct quantum data.

"Add still a few more qubits, and we should be able to run quantum simulations of some quantum phenomena and so forth. But when this process arrives to 'a practical quantum computer' is very much a question of defining what 'a practical quantum computer' really is. The best outcome of our research in this field would be to discover that we cannot build a quantum computer for some very fundamental reason, then maybe we would learn something new and something profound about the laws of nature," Ekert says.

Gildert adds that the key area for quantum computing will be machine learning, which is strongly linked to the field of artificial intelligence (AI).

"This is radically different from how we use computing for most tasks today," Gildert says. "The reason that learning software is not ubiquitous is that there are some very difficult and core mathematical problems known as optimization problems under the hood when you look closely at machine learning software. D-Wave is building a hardware engine that is designed to tackle those hard problems, opening the door to an entirely new way of programming and creating useful pieces of code."

According to Gildert, one very important real-world application is in the field of medical diagnosis. It's possible to write a program that applies hand-coded rules to X-ray or MRI images to try to detect whether there is a tumor in the image. But current software can only perform as well as the expert doctors' knowledge regarding what to look for in those images. With learning software, the program is shown examples of X-rays or MRI scans with and without tumors, then it learns the differences itself without having to be told. With this technology, the computer can even detect anomalies that a doctor cannot see or might not even notice. And the more examples you show it, the better it gets at this task.

"It is unlikely that QCs will replace desktop machines any time soon," Gildert says. "In terms of years, it depends on the effort invested, available funding, and the people working on the problem. The logical assumption is that these machines will be cloud-based co-processors for existing data centers used by companies that have very difficult problems to solve. Quantum systems are very good at solving a specific class of hard problems in the fields of AI and machine learning, so we are concentrating on building tools that help introduce the potentials of quantum computing to the people who work in these areas."

Addison Snell, CEO of Intersect360 Research, an analyst firm specializing in high-performance computing, says, "Quantum computing is still of interest primarily among government and defense research labs. And, while the principles of quantum computing have been described for years, it is a wholly new paradigm, and the number of applications it will work for, even theoretically at this point, is small. However, some of these applications could be relevant to national security, so a high degree of interest remains."

He adds, "At this point, it is uncertain whether quantum computing will ever have any role beyond a small handful of boutique supercomputing installations; but if or when it does, it is not likely we'll see commercially available working systems within the next five years."

Stamp adds, "I think that for a genuine quantum computer, we may be talking about 10 years for something that a very big company can buy and 25 to 30 years for the ordinary consumer."

"I'd put quantum computing, even if it proves competitive and valid, 20 years out because of the very complex infrastructure that has to go with it," says Michael Peterson, analyst and CEO at Strategic Research Corporation. "Developing a new technology like this requires 'breaking the laws of physics' more than once.' However, we did it with disk technology many times over during the past 25 years, and we'll do it many times more."

Mordoff adds that there are other commercial companies evaluating quantum computers, but no one is actually using them thus far, except Lockheed and D-Wave, of course.

Tully sums it up this way: "Some researchers believe that general purpose quantum computers will never be developed. Instead, they will be dedicated to a narrow class of use such as the optimization engine of D-Wave Systems. This suggests architectures where traditional computers offload specific calculations to dedicated quantum acceleration engines. It's still likely to be around 10 years before the acceleration engine approach is ready for general adoption by the classes of user that can make use of them. ■

Sartain is the author of "Data Networks 101" and a freelance journalist. She can be reached at julesds@comcast.net.

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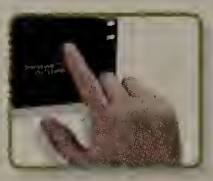

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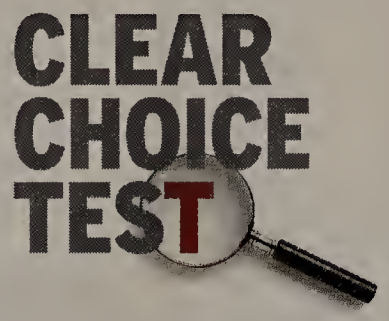
vSphere 5 sets the virtualization bar

VMware delivers pricey, powerful tool that features new storage virtualization

BY TOM HENDERSON



VSphere 5.0, the latest iteration of VMware's Cloud Operating System, boasts a wealth of updates, including new tools to manage fleets of VMs, and vast tiers of virtualized, vMotion-enabled storage links.

Since storage powerhouse EMC owns a significant chunk of VMware, we always wondered when the storage dimension would become exploited more heavily, and we got the answer. But the storage-related enhancements are by no means EMC-specific.

VMware's feature list comes at a price per processor that ranges from as low as $83 to as high as $3,495. And that doesn't cover the cost of Acceleration Kits. What you get with vSphere 5 is a feature set of inclining gradients that include stronger storage virtualization options, large and wide hardware support (in terms of vCPUs per VM, memory and storage) and new capacity to roll out and "life cycle" VMs at a very fast pace.

Preventing server sprawl is accomplished in the way vSphere controls the VMs and their storage as objects.

So many tiers of feature support can be confusing, and VMware had to send a cheat sheet so that we could keep track of what was available in what type of license.

IP address issues addressed

We performed both a bare-metal install and an upgrade of our existing VMware vSphere 4 installation. Our small network operations center (100-plus cores in six test servers, and Dell-Compellent SAN) isn't the best place to hammer vSphere 5, but we were able to give it a bit of a workout. (Note that support for ESX VMs has expired in vSphere 5.)

VCenter, vSphere's central control app, can now be run as a VM appliance if desired; the appliance runs SUSE Linux, and is lightweight. Other executables still have Windows executable equivalents if you need them; we didn't.

The initial upgrades went smoothly, save for the fact that the vSphere installers misidentified the name of our Active Directory domain, a small problem that had us scratching our heads.

There are incumbent steps to upgrade VMware's virtual switch appliance, and the new strategy removes a lot of IP addressing problems that existed in the prior release.

IP addressing can be a problem for administrators when moving VMs around, especially from facility to facility, as each is likely to have its own location-endemic addressing allocation needs.

The prior version of vSphere, while allowing for a bit of location-diverse addressing, didn't have strong multi-site transparency. The new virtual switch takes care of a lot of the misery for both IPv4 and IPv6 addressing schemes. It's not quite ideal, and some administrative functions must be done outside of the appliance, but its visuals allow a more inter-site understanding of addressing needs and allocations.

Thin-provisioning options

We used both our lab and our NOC resources to launch varying sized VMs of different operating system types — mostly Windows 2003/2008 R2 and Red Hat, CentOS and Ubuntu Linux. There was no mystery. VM conversions were unmentionably easy, save for some important characteristics: We now had up to 32vCPUs per virtual machine (with advanced licensing option cost), and could see a tremendous amount of oversubscribed (if set) memory and storage.

It's possible to thin-provision (oversubscribe, under-allocate in actuality) almost every operational characteristic of a VM. Doing so has benefits, depending on the settings we used, and allows vSphere to make recommendations or simply move VMs from one server to another to manage actual needs, versus initial judgments.

In doing so, VMware has also met a checklist item with over-subscription capabilities for those needing multi-tenancy options, as thin-provisioning permits "elbow room" that can later be physically provisioned when tasks and campaigns mount up.

In other words, less needs to be known about actual server behavior, as VMware can be set to move VMs around to match their execution needs, even when those needs have been capped/throttled by an administrator. Using set guidelines, vSphere will refit VMs into servers to adjust workloads and demands. Control over what VMs go where can be very highly defined and rigid, but ability to fit VMs into hardware servers based on their performance characteristics takes a little time as the process is based on accumulated observations of behavior.

It took nearly a day before vSphere started to move things around. We could have made it more sensitive (and move more quickly to adjust), but we wanted to see what it would do.

We noted that several improvements have been made to both online error messages and VMware's notoriously obtuse docs, as well. That said, VMware's UIs, when used by a browser access, are difficult, and error messages can be totally missing.

We ascribed part of this to the fact that vSphere was a brand-new release, yet we were occasionally frustrated with Web access interaction with the new appliance. We noted that interactions allowed us to scramble ports, and used SSL where that was appropriate. Overall, there was a stronger security feel.

We tested fault tolerance and auto-controlled/manually suggested VM movement. As we launched certain VMs, we forced them into make-work applications to analyze their CPU use. VMware picks up on CPU with a bit more sensitivity, we found, but other behavioral characteristics can force a move, too.

We decided to attack one Linux app with lots of artificial IP traffic. Almost like a waiter moving customers in a restaurant, the VM was moved across to another server on the same VLAN — whose traffic was essentially nil. Downtime was about four seconds or less.

Advanced storage features

More interesting, however, is how our Dell Compellent SAN resources can be used, and we tested these resources without the soon-to-be-delivered glue software from Dell specifically for VMware vSphere 5. These resources are also potentially expensive to use, depending

NETRESULTS

Product	VMware vSphere 5.0.1
Company	VMware
Price	Essentials Plus: $83 per processor; additional features, $349 to $3,495.
Pros	State-of-the-art, adds storage array control.
Cons	Expensive; minor rough edges.

on needs and the license type chosen.

High Availability, vMotion and Data Recovery are in the Standard and Advanced versions, ranging from $395 to $995 and limited to eight vCPUs/VM.

Add in Virtual Serial Port Connector, Hot Add (CPUs, memory, vDisks), vShield Zones (of fault protection), Fault Tolerance (detect, move), Storage APIs for Array Integration, Storage vMotion (move your VMs and/or storage live) and the Distributed Resource Scheduler and Distributed Power Management, and you've hit the vSphere 5 Enterprise License. That's $2,875 per processor and limited to eight vCPUs.

If you go all the way to vSphere Enterprise Plus at $3,495 per processor, you can graduate to 32 vCPUs per VM, and add the aforementioned Distributed Switch, I/O Controls for network and storage, establish Host Profiles and have Profile-Driven Storage, use the Auto Deploy (intelligent VM launch) and use the Storage Distributed Resource Scheduler (Storage DRS).

For mission-critical applications, Storage DRS may be worth the price of admission for some. When a compatible array is used, one can group disk resources as an object, and move the whole object (active disks and all) to another part of the array. This means that aggregated infrastructure can be moved wholesale without outage, as an object, perhaps guided by administratively selected fault detection or just the need for maintenance.

As our Dell Compellent SAN lacked the new drivers, we were unable to perform the heavy lifting promised. You'll need a high-performance SAN transport to move the data around, Fibre Channel at minimum, but other interfaces like InfiniBand ought to do well.

Yet at the bottom end of things, VMware's High Availability still works marvelously. Moving VMs from host to host and back and forth from the NOC to the lab worked flawlessly, if somewhat encumbered by aperiodicity in our Comcast transport to the NOC. This trick can now be done by all of VMware's competitors as a basic, but it's part of VMware's DNA and it shows.

From a practical perspective, most of VMware's competitors can do these basic tasks, but some of the competition suffers from OS version/brand fixation and doesn't have egalitarian support. Others that have egalitarian OS support have weak storage management and overall virtualized data center/cloud support.

VMware's vSphere covers all of the bases as close to the state-of-the-art as any production software we've seen. It's still wickedly expensive, and it's the one to beat. ■

SCORECARD

VMware vSphere 5.0.1	
Administration/ Management (25%)	4.5
Installation/ Compatibility (25%)	4.5
Security (25%)	4
Features/ Performance (25%)	4.5
Total	**4.3**

SCORING KEY: 5: EXCEPTIONAL; 4: VERY GOOD; 3: AVERAGE; 2: BELOW AVERAGE; 1: SUBPAR OR NOT AVAILABLE

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NETWORKWORLD

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BACKSPIN | BY MARK GIBBS

AT&T and alternate universes

OVER THE last few months I kept seeing online ads for something called "Quantum Jumping" and I finally got around to investigating what it's all about: It is complete and utter nonsense.

Hyped by one Burt Goldman, Quantum Jumping is a heady mashup of metaphysics, misinterpreted and misunderstood physics, and marketing. It takes the multiverse theory, which speculates wildly (and, to date, untestably) that ours is only one of an infinite number of universes, and claims that, through "a powerful & time-tested combination of meditation and visualization," you can "jump" into "parallel dimensions" and gain "skills, knowledge, wisdom and inspiration from alternate versions of yourself." You've got to laugh at this silliness.

I bring this up because there's one tech company in the process of trying to convince us that an alternate universe actually exists and would be a good thing. I refer to AT&T, which contends that its proposed $39 billion merger with T-Mobile will create jobs and improve cellular service and competitiveness.

The job creation issue — that nearly 100,000 new jobs would just appear (see tinyurl.com/3ln5an6) — is one of the most indefensible assertions AT&T makes. In fact, a recent study, "The AT&T/T-Mobile Merger: A Recipe for Reducing Jobs for American Workers" by David Neumark, who's a professor of economics and director of the Center for Economics and Public Policy at the University of California at Irvine, concluded: "Since 2002, AT&T has eliminated over 107,000 jobs relative to the growth in employment that would have occurred from the acquisitions that occurred during that time period. This evidence is consistent with AT&T's past mergers generating job loss."

Rather surprisingly, AT&T's job creation claim is being backed up by the Communication Workers of America, the union that something like 56% of AT&T's workforce belongs to. This unlikely support is because the workers at T-Mobile, which has managed to largely keep unions out of its business, would be the ones to be "right-sized" or "rationalized" out of their jobs should the merger happen!

Somehow AT&T has managed to get support from the Louisiana Ballooning Foundation and the Michigan Milk Producers Association. Along for the ride with the above organizations are 17 state governors and 11 state attorneys general, which just goes to show how well spent AT&T's lobbying dollars have been (a total of $11.7 million in the first half of 2011).

Fighting the metaphysical pull of the AT&T-verse are seven state attorneys general, Sprint Nextel and Cellular South, as well as the U.S. Department of Justice. The latter is opposed to the deal, not because of the jobs creation nonsense, but because of antitrust concerns (the deal would give AT&T 96 out of the largest 100 markets and a total market share of around 40%).

According to sources quoted in a *Forbes* article, the chances of AT&T acquiring T-Mobile are between 30% and 40% and, should it succeed, it will probably be at the cost of 30% to 40% of its assets.

While there's a good chance AT&T won't succeed, don't assume that defeat is a sure thing and that we won't all be catapulted into the AT&T alternate universe. As crazy as its theories about jobs might be, it is more real than Quantum Jumping and a lot less amusing. ■

Gibbs stays in place in Ventura, Calif. — backspin@gibbs.com.

NETBUZZ | BY PAUL MCNAMARA

Page's Google+ page proves problematic

SEEMINGLY EVERY day, the Google+ "suggestions" feature would implore me to "circle" (read: follow) the Google+ activities of Google CEO Larry Page, as more than 300,000 users had done already.

Finally, I decided to relent — probably should have done so long ago — and clicked on the link to Page's page so I could see what I'd been missing: It turns out that I hadn't been missing much of anything, at least not for the past month, as Page hadn't posted a word to Google+ (for public consumption) for that long.

What's up with that?

After all, Page had been reasonably active on Google+ early on: publicly congratulating the Google+ troops upon launch of the service in late June; sharing vacation photo after vacation photo; pointing out an interesting story about some French trans-Arctic adventurers; and trumpeting the company's acquisition of Motorola Mobility.

That last one was the last one, though, dated Aug. 15. So where'd he go?

Yes, world domination can keep a CEO busy and Page certainly cannot be expected to use every Google product, but Google+ and social networking are considered critical to the company's future, and there are already whispers about waning interest in some circles without the CEO creating at least the impression of having gone napping himself.

When I asked Google for comment, here's the reply they gave me: "We don't comment on individual profiles, but it's important to keep in mind that sharing activity can be taking place privately to circles. As we've shared before, we're seeing that people are two to three times more likely to share content with one of their circles than to make a public post."

My reply to Google's reply: That's all well and good, but it doesn't address the central issue raised, which is that it doesn't look good to have Google's CEO publicly appear on — then publicly disappear from — the company's fledgling social networking platform, especially at this early stage of its attempt to gain hearts and minds.

Yes, it's certainly possible that Page has continued to use Google+ regularly to share his thoughts and funny YouTube videos with a subset or subsets of the 300,000 people who have circled him; those interactions would not appear among his public posts. Google employees who are active on Google+ claim that such is indeed the case.

But if that's so, why shouldn't Page come out and simply acknowledge that he's had a change of heart and chosen to keep his Google+ activities private? Instead, it appears as though he only went through the motions of participating publicly in the early weeks.

And the platform itself continues to suggest that users follow Page. Since I first visited Page's page and wrote about it on Buzzblog, an additional 75,000 Google+ users have "circled" the CEO.

My guess is they're expecting to hear from him.

If they don't, it's a certainty that a good number of them will assume he's lost interest in that particular communications channel. No one would advise any CEO to create that kind of impression. That this particular CEO is in charge of the platform and its future makes the impression much more potentially troublesome. ■

I've always been easy to reach. The address is buzz@nww.com.

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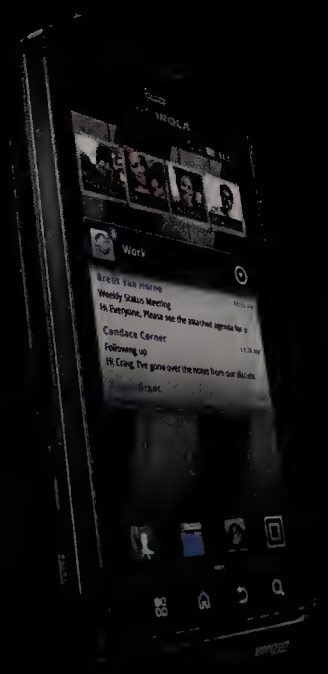

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